# The Builder.

VOL. LXXXIII.—No. 3110. SEPTEMBER 13, 1902


## ILLUSTRATIONS.


Church of St. John the Divine, Sidcup ..... Mr. G. H. Fellowes Prynne, F.R.I.B.A., Architect.
Village Church, Port Sunlight ..... Messrs. William & Segar Owen, Architects.
House at Wolves Newton ..... Mr. A. Jessop Hardwick, Architect.


*Blocks in Text.*


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### *The Restoration of the Erechtheion.*

TWO years ago we gave some account of the "restorations" now being carried on upon the Acropolis of Athens—and at the time we ventured to express our fears that, as is usual in such cases, there would be a danger of overdoing the work. Since then the work has very much progressed, and is, perhaps, approaching completion as far as the Parthenon is concerned. We are now able to judge of the result, and whilst admitting the necessity of doing something to preserve the ruin in as intact a manner as possible, we still think more might have been done in the way of support by steel stanchions, ties, &c., instead of replacing portions of the ruin with new marble trabeation, mouldings, and even capitals to the columns. The inner range of columns of the west pediment of the Parthenon is now provided with a completely restored trabeated architrave resting on capitals which have nearly all been restored in halves—*i.e.*, the huge Doric capitals where defective seem to have been cut in half perpendicularly, and a new marble half has been joined on to so much of the original capital as could be retained. Fragments of the original sculptured metopes have been replaced over this new marble architrave. The base of the old Turkish minaret, with its winding staircase, still blocks up one side and angle of the portico. This will, no doubt, be removed in due course. The marble for the work is all being provided by the English Marble Company, which is now working the ancient Pentelicus quarries on a grand scale, turning out blocks far larger than the ancient Greeks ever contemplated using. A visit to these quarries with their elaborate machinery and wire saws, stretching across from hill to hill, constitutes an interesting addition to a visit to Athens.

There must always be a certain sense of the ridiculous when one examines a "faked-up" ruin—the more so according to the importance of the monument in question. Both in Athens and Rome very much is being done to the ruins of classic times which our descendants—for whose benefit we are presumably working—will look upon with astonishment and regret. In Athens these restorations of primitive monuments are especially out of place, considering their Cyclopean character and their much ruined condition. To restore a mediæval church or castle is, perhaps, excusable on the score of utility—an excuse which can hardly be urged in the case of a disused pagan temple or a Cyclopean ruin resembling Stonehenge.

Possessed by that insatiable spirit of inquiry which leaves no stone unturned in the course of modern investigation, the international corps of archæologists stationed in Athens, who may be considered to control the destinies of all the antiquities and monuments of ancient Greece, has destroyed every trace of the curious subsequent history of the site. Moslem, Frank, and Byzantine evidences of occupation have been ruthlessly removed, and, as a consequence, many traces of still older buildings which would probably survive under the successive layers of these later constructions have disappeared. The archæologists of the last fifty years seem to have been determined to denude the Acropolis of its former coating of soil, and every ancient monument upon it of the usual accompaniments of mud walls and traces of human occupation. The Acropolis is now reduced, as far as possible, to a barren rock covered with mutilated blocks of marble.

In ancient times the Acropolis was covered with mud-wall buildings, the adjuncts of the Parthenon and its prehistoric predecessor, the plan of which latter has only been unearthed during the last few years. As has been proved on many occasions, the cob-wall buildings of an extreme antiquity may be traced even at the present day surviving in the dry climate of the Levant, and the rubble foundations on which they were built are, of course, common enough. But, unfortunately, on the Acropolis all traces of such a kind have now disappeared, in consequence of the extensive excavation, or rather denudation, of the plateau. During this denudation the immense collection of primitive art fragments now in the Acropolis Museum was found.

The triple monument known as the Erechtheion has suffered very much from the alterations to which it has been subjected, even in classic times. At the present day it is practically an unintelligible ruin, and all authorities seem agreed that there is no evidence as to the actual intention or use of the three porticoes. No suggestion has ever been advanced as to the object for which the very remarkable projecting bay decorated with the caryatides can have been intended. It is commonly termed a portico, but it can hardly be considered as such in the ordinary sense of a porch or covered entrance. It would seem to be mentioned on the famous inscribed tablet referring to the Erechtheion (in Brit. Mus.) written at the beginning of the fourth century B.C. But the use it may have served, or the purpose for which it may have been constructed, still remains an unexplained mystery. The puzzle is complicated by a possibility that the *Adytum* with which it may have been connected, and the colonnaded wall above (represented in Stuart and Revett, but since ruined), are of Late Roman work.*

To the present writer the caryatide "portico" suggests the idea of a gallery for displaying relics, &c., or perhaps a special seat for the priestesses of Vesta at the time of the great festivals on the Acropolis. In any case a wooden floor or staging must have been provided inside the high stylobate, if such were the use.

The western portion of the collection of buildings called Erechtheion has completely disappeared, leaving a few traces of where it was joined to the existing fragment behind the north portico. The elaborate old steel engravings of the nineteenth century, in the innumerable works which have been published on the Acropolis, are invariably incorrect in their planning of these traces. To judge by the stones which still survive, the western portion of the group of buildings must have been most irregularly joined on—probably with the idea of following the contour of the Acropolis summit. But as we have already remarked, the rock of the Acropolis has become denuded of everything except fragments of marble, and any

* The *Adytum* or crypt here referred to is the oblong chamber at the west end of the building, with a doorway leading to the vanished portions of the Erechtheion. This underground chamber has in subsequent times been turned into a cistern, to judge by the thick layers of cement still remaining on some of the walls. Another small crypt, in which is the mouth of a well, exists underneath the north portico.

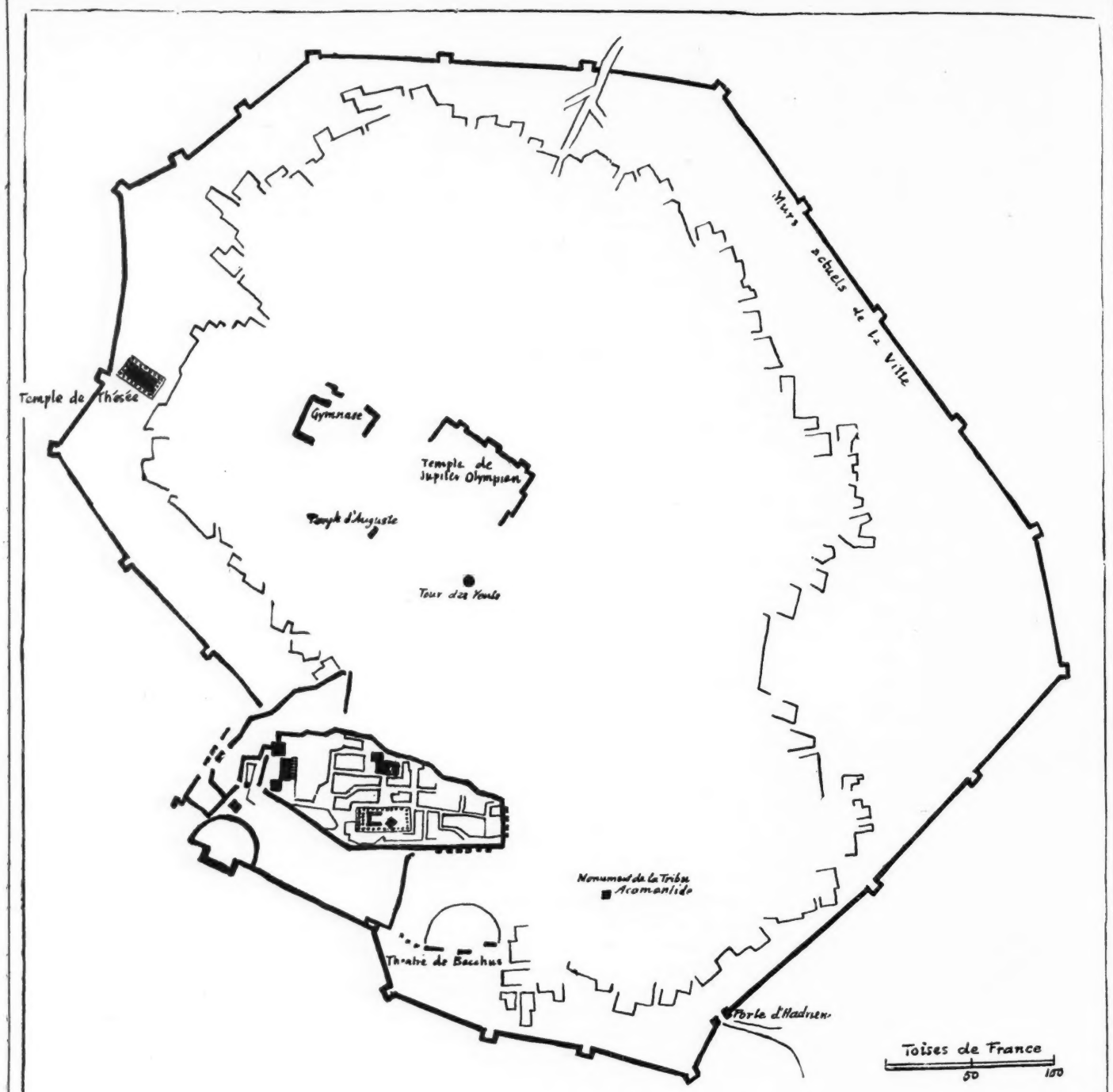


*Fig. 1.*

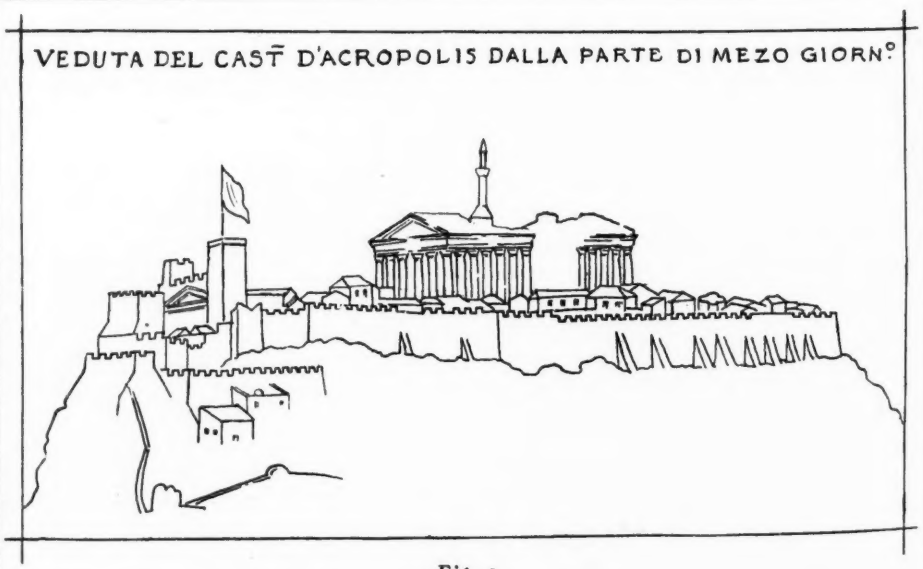


*Fig. 2.*

trace of such buildings as the western portion of the Erechtheion, which may very possibly have been of inferior materials, has been swept away.

The accompanying plan of the Acropolis (fig. 1), which occurs in several books of the early nineteenth century, represents it in a condition immediately preceding the era of denudation by the archæologists. It is interesting to observe the disposition of the roadways at that period, which probably reproduces to some extent the older disposition of the site. At that time the outline of the western portion of the Erechtheion seems to have been preserved in the oblong building occupying that position. This plan has been taken from the Report of the French expedition to the Levant at the beginning of the nineteenth century. The same plate has been used in Walpole's "Travels in the Levant" (London, 1817). The view of the Acropolis showing the houses and fortifications after the ruin of the Parthenon (fig. 2) is by the Venetian engineer Verneda, shortly after the siege in 1687.

At present the Erechtheion is undergoing a very thorough "restoration" (fig. 3)—but, perhaps, on more conservative lines than has been the case with the Parthenon. There is less appearance of new marble, and more reliance is evidently being placed on ron-work in supports and ties.

A great deal of the Erechtheion was "replaced" in 1838, at the time when the

traces of Turkish occupation were cleared away, and not long after the date when so many details of the building were carried off by Lord Elgin. Since then very little has been done to the ruin except to clear away the

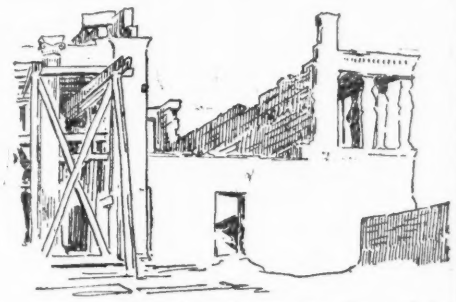

*Fig. 3.—Commencing the Restoration of the West End of the Erechtheion.*

earth from its base. It is to be hoped that the present "restoration" may be as satisfactory as that of the charming little Temple of Winged Victory, which was put together once more in 1835, after serving as material to form a Turkish battery.

## A FRENCH MANUAL OF MEDIÆVAL ARCHITECTURE.

MONS. ENLART'S manual* follows very much on the same lines as the "Abécédaire" of M. de Caumont, published in 1853, and comprised in two volumes, the first dealing with ecclesiastical, and the second with civil and military, architecture. As yet only one volume has appeared of M. Enlart's work devoted to "Architecture Réligieuse," but in his preface he refers to a second which will comprise "Architecture Civile" and form the first part only of a complete manual of French archæology. The second will include "mobilier," costume, sculpture, painting, and iconography.

A comparison of this first volume with M. de Caumont's shows the great strides which have been made during the last half-century in the science of archæology, for M. de Caumont, who is regarded as its founder in France, put forward what were then new theories in a tentative manner only, and was accustomed to return again and again to the subject in the *Bulletin Monumentale* to limit or modify some of his statements. M. Enlart, on the other hand, is able now to speak with much greater authority on the subject owing to numerous works published since, to the archives of the "Commission des Monuments Historiques," and to the very large collection of photographs taken for that Commission. These have enabled M. Enlart to compile a record of hundreds, if not of thousands, of churches, many of which were unknown in De Caumont's time; he claims also to have visited the greater number of the buildings mentioned in his work, giving him a grasp of the subject which one recognises throughout in his work.

M. Enlart's first volume, which unfortunately is not provided with an index (a common defect in all French architectural publications), is divided into seven chapters, the first being devoted to definitions and principles, and the second and subsequent chapters to (2) Latin and Merovingian; (3) Carlovingian; (4) Romanesque; (5) Gothic; (6) Renaissance; and (7) Architectural Accessories.

The first chapter, to which 100 pages are devoted, is original in its treatment and of great interest and value, so much so that it might have been extended to form a volume by itself. The first eight of its eighteen sections serve as a kind of glossary, including, however, only those terms which are in everyday use, but describing them in detail. As a definition of the elements of mediæval architecture, a description of the various materials employed, and a summary of the principal constructive features found therein, it errs, if anything, only by its necessary restriction. Subsequent sections describe the habits and customs of the artists of the Middle Ages, the resources for building, transport of materials, the custom in early work of using up the decorative features of more ancient buildings, attempts at imitation and other archaisms. In Section 16, "Repentirs et Refaçons," we find a new term, "Repentirs," defined as changes occasionally found in churches which have taken place during the progress of the work. "Refaçons" are partial reconstructions at a later period, such as the vaulting of a nave originally built to carry a timber roof (Abbaye-aux-Hommes, Caen). The last section deals with the value of recorded dates of foundations, and points out the danger of accepting them without due comparison with other work, owing to the fact that reconstructions have frequently taken place within comparatively short periods of one another. In all these cases references are given to existing examples in copious notes.

In consequence of the paucity of examples of either the Merovingian or Carlovingian periods in France, the second and third chapters of M. Enlart's work (assumed to deal with French archæology only) are more concerned with buildings outside France, and we think that the two chapters might have been merged into one, especially as in the latter the title given is "Carlovingien et Baptistères," as if baptisteries were independent of period or style, and he has been obliged to give a second description of the one Merovingian baptistery in France, that of St. John at Poitiers. We note in chap. iii. an illustration of the section of the church of Germigny-les-Prés, in which a dome, resting on squinches, is shown over the tower. There is no authority for this, and a glance at Constant Dufeux's measured drawings of the same, published in Vol. VIII. of César Daly's "Revue d'Architecture," will show that it is quite impossible that there were ever any squinches to carry the dome. The church has lately been restored, and it is probably one of those "restaurations déplorables" to which M. Enlart constantly refers throughout his work. The French theory of restoration, such as is approved by the bishops throughout France, is that—first, so far as the funds will allow, the structure should be rebuilt to last for another 500 years; and second, that such alterations and improvements (?) may be introduced as the architect of the Middle Ages might have adopted if he had been living at the present day. This is how the front at Périgueux was restored, or rather destroyed so far as its history is concerned. In the Church of Notre Dame at Poitiers the fine ashlar work of the two western bays (built fifty years or more later than the eastern portion) has been replaced by "petit appareil"—small rubble masonry—so that it might accord with the work of the earlier church. Folly can go no further.

In the fourth chapter, describing the architecture of the Romanesque period, M. Enlart devotes to it almost as many pages as in that given to Gothic work, and in this respect fills up a gap left in M. Viollet-le-Duc's "Dictionnaire Raisonné," which dealt more fully with the complete development of the style than with its earlier conceptions.

Owing to the vast extent of ground which M. Enlart has to cover in these two chapters, it has only been possible to give a tithe of the illustrations required to explain their description; and the references given in the notes to hundreds of churches cannot be expected to take their place, so that, unless by chance the buildings are known to the reader, or can be followed by him in the collection of photographs in the Trocadéro library, these references have not the value which M. Enlart apparently attaches to them. We note this because not only are there too few illustrations, but a large number of those given might have been dispensed with altogether, being either very poor examples or misleading from the position they occupy. In Section 16, dealing with the important subject of Romanesque elevations, only one illustration is given, viz., fig. 97, two bays of the section of the Church of Cerisy-le-Fôret. In Section 17, treating of the Romanesque vault, fig. 98 represents a church without vaults in either nave or aisles. At fig. 116 is the elevation of St. Front de Périgueux, which should have come in the preceding section.

There are many passages in the manual which will amuse its English readers. In the preface M. Enlart discusses the terms which are employed to define the architecture of the Middle Ages. "Gothic" he thinks quite unmeaning, and "Ogival" or "Pointed" insufficient. "French architecture" he thinks would be the most exact, but then "we have had," he says, "so many styles of French architecture." Section 4 of the fifth chapter on Gothic architecture is devoted to the expansion or spread of French Gothic architecture beyond the French frontiers, and it will be new to us to learn that in Beverley, Hereford, Rievaulx, Ripon, Worcester, and York we continued to follow the Norman school, and that the style of the cathedrals of Salisbury, Winchester, and Wells was imported from Anjou, and recalls Puy-Notre-Dame, Candes, and Cunault, all in that province. He claims that in the architecture of the two sections the Gothic art of the South was imported in 1266 by Charles I. of Anjou, being unaware that probably the Saracenic artists of Sicily carried their style into the Holy Land in the twelfth century, and that the pointed arch arcades of two orders, as built by them in Syria, were imported afterwards into France by the Crusaders. On the other hand, M. Enlart fails to recognise that the pendentives and domes of Périgord, dating from 1013 A.D., were taken by the French to the Holy Land, and that the Church of St. Barnabas in Cyprus, which he seems to think might have been the source from which the masons of Périgord derived their domes, was distinctly the work of the Périgordian masons; the eastern dome dates from the first half of the twelfth century, and the western dome, with its double order of pointed arches, fifty or sixty years later in

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* "Manuel d'Archéologie Française depuis les Temps Mérovingiens jusqu'à la Renaissance." Première Partie, h cture, par Camille Enlart. Paris: Alphonse icard et Fils. 1902.

the same century. M. Enlart is of opinion that the plan and design of St. Front were taken from the Church of the Holy Apostles at Constantinople, and not from the Church of St. Mark at Venice, and so gives the last *coup de grâce* to M. Verneilh's theory of the Venetian colony at Limoges.

The best sections in both the Romanesque and Gothic periods are those describing church towers and belfries, and they are also the best illustrated.

Chap. vi., devoted to the Renaissance period, deals only with those buildings into which Italian ornament enters, the conceptions being still Gothic. The churches described and illustrated belong to a period which has hitherto been somewhat neglected, owing to the greater interest felt in its secular architecture. This chapter is, therefore, a valuable addition to our knowledge.

The last chapter of the volume (vii.) treats of what are called "Accessories de l'Architecture Réligieuse," such as altars, piscinas, pulpits, choir-screens, fonts, ossuaries, &c., among which the altars are the best illustrated. The first section refers to pottery which is sometimes found embedded in vaults, and is assumed to have served acoustic purposes. In the illustration given, fig. 350, portions of the vault of a church at Famagusta in Cyprus are shown, and as the mouth of the terra-cotta jug (for the specimens shown all have handles and, therefore, were made for other purposes) opened into the church, some such object as that mentioned may have been aimed at. As shown in fig. 350, they were evidently not built in to lighten the vault, as is the case with those embedded in the cupola of San Vitale at Ravenna. Some examples are referred to in the notes of similar employment in the vaults of some French churches, but from the few churches quoted the employment of such acoustic vases must have been rare.

We have already referred to the copious references to churches in every Department of France. An additional value to these is given in the list following the chapter on Gothic architecture by the inclusion of the names of the master masons employed in some of the principal cathedrals and churches. In the Church of St. Rémi at Rheims M. Enlart has been able to trace the names of eight or nine "maîtres-d'œuvres" who conducted the works from 1211 to 1359 A.D. Following after the sixth chapter is a list of the principal artists of the Early Renaissance in France—some Italians and some Frenchmen who had pursued their studies in Italy, and, lastly, those Frenchmen who were trained in France. In all these cases a list of their works and the dates thereof are given.

In conclusion, M. Enlart's manual is a work showing considerable research, which cannot fail to be of great service to those architectural students who are acquainted with some of the buildings described. It would add to the value of his work if, in the second edition which he contemplates, he would, failing an illustration of some important feature he is describing, refer the student to some work where it is represented, giving the number of the plate or woodcut. It is not sufficient to the note to give the name only of a church where the feature may be found, and there are not many students who could find the time and opportunity for consulting the numerous works quoted in the Bibliography.

## NOTES.

**The British Association.**

THE seventy-second annual meeting of the British Association for the Advancement of Science was opened at Belfast on Wednesday, when the President's address was delivered by Professor Dewar. The address was a notable one, an important part of it being taken up with the question of scientific education. The President referred to the enormous expansion in recent years of German industries, particularly the chemical industries, which were largely founded upon basic discoveries made by English chemists, but never properly appreciated or scientifically developed in the land of their birth. What was the explanation of this disastrous phenomenon? In one word, it was want of education. We had the material in abundance when other nations had comparatively little. We had the capital, and we had the brains, for we originated the whole thing. But we did not possess the diffused education, without which the ideas of men of genius cannot fructify beyond the limited scope of an individual. The root of the mischief was in the want of education among our so-called educated classes, and secondarily among the workmen on whom these depended:—

"It is in the abundance of men of ordinary plodding ability, thoroughly trained and methodically directed, that Germany at present has so commanding an advantage. It is the failure of our schools to turn out, and of our manufacturers to demand, men of this kind, which explains our loss of some valuable industries and our precarious hold upon others. Let no one imagine for a moment that this deficiency can be remedied by any amount of that technical training which is now the fashionable nostrum. It is an excellent thing, no doubt, but it must rest upon a foundation of general training. Mental habits are formed for good or evil long before men go to the technical schools. We have to begin at the beginning. To my mind, the really appalling thing is not that the Germans have seized this or the other industry, or even that they may have seized upon a dozen industries. It is that the German population has reached a point of general training and specialised equipment which it will take us two generations of hard and intelligently directed educational work to attain."

Facts and opinions similar to these have been expressed before, but it is satisfactory that they should be publicly stated by this year's President of the British Association.

**Municipal Competition.**

IN a series of voluminous articles the *Times* is now engaged in dealing with the complex question of "Municipal Socialism." One point emphasised amongst many others by the writer is the injustice done to private traders by municipal competition, but we find no word of sympathy for architects, engineers, and other professional men who are necessarily deprived of remunerative practice by the countless multiplication of public officials. Almost every borough surveyor and every surveyor to a district council has now come to regard himself as an architect as well as a civil, mechanical, electrical, and sanitary engineer. He will cheerfully undertake the design of bridges, town halls, technical institutes, hospitals, bathing establishments, electric light and power installations, destructor stations, or anything else that may be wanted. It is very rarely that one man can be found who is adequately qualified by training and practical experience for so varied a selection of duties, and the struggle with novel problems seldom leads to satisfactory results, while the acquirement of proficiency by the surveyor certainly adds to the burdens of the long-suffering ratepayer. This aspect of "progressive municipalism" deserves some attention from our contemporary, and the architect is clearly entitled to the same sympathy which has been expressed with those engaged in industrial pursuits.

**The Sanitary Institute Congress.**

THE Sanitary Institute Congress was opened at Manchester on Tuesday, when Earl Egerton of Tatton, the President, delivered an address. In the course of some interesting remarks, Earl Egerton dealt with several subjects of national importance, such as the housing of the working classes, national health, &c. In speaking of the physical power of the inhabitants of large towns, he said that the commercial position of this country, threatened as it is by the vigorous races of North America and by the trained intellects of Germany, depended on the British people being roused to greater vigour and adapting themselves more readily to the change of circumstances produced by the introduction of new forces, new motive powers, and greater facilities of locomotion. Later on he said: In that great city (Manchester) they had triumphs of engineering and mechanical art applied to various industries, but the population which inhabited it had, as in other large towns, degenerated in size and physical power from the ancestor or progenitor who was attracted into the town by higher wages from the country districts. The same process was still going on; and the large percentage of rejections from physical disabilities among those who offered themselves as recruits, even in Manchester itself, gave an alarming proof of the degeneracy of the town population While this is unfortunately true, are the methods proposed to arrest this deterioration, and to make up for the necessary drawbacks of town life, *i.e.*, greater care in the physical education of the young and in teaching them the principles of hygiene or the preservation of health, the only or the most likely ones to arrest this decay? A great deal could be done for the health of the working-class population of large towns by the provision of dwellings in the suburbs, and still more if employers would transplant industries to the rural districts.

**The Choice of Steam Boilers.**

THERE is probably no occupation more perplexing than the study of figures professing to afford guidance to the uninitiated in the selection of steam boilers, especially if the statistics are those reproduced by makers of such necessary adjuncts to modern life. According to these, almost every type of boiler seems to evaporate more water than any other boiler, and generally to do it on much cheaper terms. The easiest, but not always the cheapest, way out of the difficulty clearly is to pin one's faith to some maker of repute, and, having followed his advice, to rest confident that the result will be in every way satisfactory. And so, no doubt, it will be, for given correct design, good materials, and good workmanship, any boiler may be relied upon for efficiency and durability. Variable as published records may be, the variations always depend upon different sets of conditions, and

a careful analysis of statistics leads to the inevitable conclusion that within certain limits one boiler is as good as another, so far as the question of "commercial" efficiency is concerned. Thus it will be found on examination that the price of a boiler varies comparatively little with the type, providing the standard adopted for judgment is that of evaporative power. Taking nearly all types of boilers produced, the price per 1,000 lbs. of water evaporated per hour will be found to be approximately constant, when the size is reasonably large, and the pressure within moderate limits.

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The Design of Fly-Wheels.

IN the construction of engine fly-wheels, especially when of large size, the arms are frequently formed so that they offer unnecessary resistance to the air, with the result that power is wastefully expended. Some experiments recently conducted in Germany serve to demonstrate the importance of this point. The tests to which we refer were made with a heavy fly-wheel fixed between a pair of compound engines of 450 h.-p., and the arms, built with a channel section, were found to create a powerful draught, thus signifying the development of excessive air friction. For the purpose of reducing loss of power the arms were covered with sheet steel, and arrangements were made for the purpose of ascertaining the amount of the energy thereby saved. In order to carry out the trials the engine and fly-wheel were driven without load by a direct-coupled generator caused to run as a motor. Without the sheathing the absorption of power was found to be 17·83 h.-p., and with it 13·23 h.-p., thus showing a difference of 4·6 h.-p., which represented over 1 per cent. of the engine power, and an estimated saving of more than 50*l.* per annum. Similar experiments were made with a larger engine, when still greater differences were observed. These figures are worthy of note.

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Inspection of Brooklyn Bridge.

SYSTEMATIC supervision has now been substituted for the neglectful methods formerly prevailing in connexion with the Brooklyn bridge, of which Americans are justly proud. A properly qualified engineer is installed as Commissioner of Bridges, with the result that the bridge is now regularly inspected and kept in repair. Each working day a careful inspection is made by a gang of men under the supervision of the assistant engineer-in-charge, and a daily record is made of all that is done. Some time ago we referred to the failure of several suspender rods at the middle of the span, partly owing to faulty construction, but chiefly to want of proper attention. All rods of the kind are now under minute inspection, and the hinged bearings of the shorter ones are kept oiled so that they may permit free movement to take place as necessary. A number of suspender rods, removed from the structure, have been tested and in every case the breaking strength was found to be from ten to twelve times the maximum load to be carried. This result confirms the opinion we expressed at the time that want of attention to the condition of the bearings, especially necessary in view of their imperfect design, was the chief cause leading to failure of the rods.

Housing of the Working Classes.

A COUNTY COUNCIL publication has just been issued, entitled "London Statistics," which contains much interesting information relating to the work of that body. Several pages of the volume are devoted to the question of housing, particulars being given of the various schemes which the Council has dealt with. During the fourteen years the Council has been in existence it has displaced, or is about to displace, 16,278 persons from insanitary areas, at an estimated cost of clearance of 1,088,724*l.* It has provided, or is about to provide, 3,348 tenements, with accommodation for 21,526 persons, and plans are in course of preparation for 9,879 more, with accommodation for 58,000 persons. The cost of providing all this accommodation—*i.e.*, the housing value of the land, plus the cost of buildings, plans, &c., is estimated at 3,847,416*l.* This figure represents the remunerative outlay. The net cost of clearance—*i.e.*, the gross cost of clearing, less the housing value of the land—is unremunerative outlay, and falls on the rates. In connection with street improvements, involving submission of a scheme of rehousing to the Home Secretary, the Council has displaced, or is about to displace, 12,000 persons of the labouring class, and arrangements have been made for providing other accommodation for 11,500 persons. During the year under review the Council made a profit on its workmen's dwellings of 2,313*l.*, as compared with a deficiency in the previous year of 1,157*l.*

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Proposed Public Library for Greenwich.

AN advertisement has just been issued for designs for a public library proposed to be erected in the Borough of Greenwich :—"A premium of 50*l.* will be paid for the design to be adjudged the first, and a premium of 30*l.* for the second in merit, provided not less than two bonâ-fide designs be sent in. . . . The Council shall not be bound to adopt the design to be adjudged first in merit, or any design, and may adopt a design from any architect not competing." This is one of the most interesting competition advertisements which have appeared for some time. The second paragraph, which stipulates that a second premium will be awarded "if not less than two bonâ-fide designs" are sent in, is uncommonly "canny" and very funny. The latter part of the final clause, however, is neither canny nor funny. There is an honest ring about it, as if the sympathies of its composer had risen above his official conscience. If, on the other hand, it has not been so inspired, the fatuity of the Competition Committee is established, as it is difficult to conceive anything more conducive to a "one-man show," the possibility of which may be responsible for the extraordinary caution shown in the second part of the first paragraph.

## MAGAZINES AND REVIEWS.

IN the *Art Journal* Mr. Addison McLeod, in an article on "The Influence of Dante on the Art of his Century," argues that the elements of the horrible in Orcagna's paintings in the Campo Santo at Pisa are derived from Dante's "Inferno." It is not improbable, though it is a kind of thesis hardly capable of demonstration. "A Plea for the Stencil," by Mr. R. Davis Benn, is really a recommendation to take example and inspiration from the Japanese school of stencil design, in which the stencil has gained a freedom and even poetry of effect which has never been imparted to it by western decorators. A good many miniature reproductions of Japanese stencillings accompany the article, and should have a stimulating effect on the European stencil-cutter. A view of the new wing of the Metropolitan Museum at New York does not impress us very much, as its chief feature is the employment of coupled columns of an order, projected in front of the main wall line, to carry nothing at all but useless blocks of stone. Nevertheless, if the *Art Journal* so much admires what it calls "this fine addition," the editor might at least in fairness have added the name of the architect. In the ordinary English illustrated periodical one is never surprised to find the name of the architect ignored; but we must say that an "art-journal" ought at least to set a better example. An article on the armour at Hertford House is of value as coming from an expert, Mr. G. Francis Laking; and following this is a short description of a new drawing instrument, the "aerograph," which consists of a receptacle in the form of a fountain pen, through which colour is forced by working a treadle; it is the sand-blast principle, in fact, applied to the laying on of colour, and drawings can be made with it just as designs can be made with the sand-blast; but we do not think the method is of any artistic importance. It may be very useful for stencil work.

The *Magazine of Art* devotes an article to that fine painter of French coast and fishing life, M. Cottet, whose name, now celebrated, was hardly known five years ago. Mr. Walter Crane contributes an article on "Modern Decorative Art at Turin," in which he speaks pretty severely about the tendencies of the "new art," and concludes that to go through the Turin Exhibition and apply the test of selecting what one would like to live with, would involve such a process of elimination as would not leave enough to furnish one's house! M. Henri Frantz contributes an article on "The New Room at the Louvre" containing the Rothschild bequest collection, and Mr. E. F. Strange continues his article on "The Scenery of Charles Kean's Plays" and the works of scene-painters whom he employed. Several of the scenes illustrated are mainly architectural, and they are not nearly so good as the author seems to suppose. J. Days's "Entrance to St. Stephen's Chapel, Restored" is nothing better than a kind of nondescript and impossible Late Gothic—stage Gothic all over; and the scene for "Much Ado about Nothing," with two immense Greek Doric columns flanking the porch of a house, with staircase "ramps" butted against them, is absurd in every way. What has Greek Doric to do with the play? As far as there is any local colour suggested, it is an Italian Renaissance play; there was no such thing as Greek Doric in any Italian mansion of that day; its very existence, in spite of Pæstum, was not known, as one can see from the architectural publications of the period which professed to deal with the Classic orders. Hamlet's Castle at Elsinore, by Jones, is better. But the fact is that, both then and now, playgoers and theatrical critics are so ignorant of the simplest historic facts in regard to architecture, that the management has only to say that "Mr. Mahlstick has paid the greatest attention to the architectural scenery," and playgoers and critics after that will swallow anything that the scene-painter chooses to give them, without ever thinking of questioning its accuracy.

In the *Antiquary* is an interesting article by Miss Robson on "Mediæval Trading Life" and the things that have passed away in the course of modern changes and machinery; and Mr. Rutter continues his discussion of the subject of "Moated Mounds," to which we have before referred.

The *Architectural Record* (New York) opens with an article by Professor Melani, of Milan, on "Modern Italian Architecture." The illustrations do not give one a very favourable idea of modern Italian architecture, which seems to alternate between eccentricity and a rather dull classicism. The modern Florentine architects, we are told, are more under the dominion of classic precedent than those of the other leading Italian cities, and are "deficient in imagination." . . . "If they have to erect a monumental palace they cling to the design of the Palazzo Strozzi; if a residence or country house is wanted, they fall back upon the style of Brunelleschi, and compose a façade exhibiting an absolute respect for straight line and symmetry. The façade

always has the round door in the centre, and at the side windows decorated with pediments, while on the second and third floors the windows are likewise adorned alternately with rectangular or curvilinear pediments. The *ensemble* is sometimes pretty, but eternally the same." In Venice "the partisans of the straight line are doing a great deal of harm," and one is not surprised to be told that "Venice is losing that local colour which is its principal merit"; a rather cold way of putting it, by the way. The charm of Venice, in fact, seems to appeal much more to northern visitors than to Italians; and as to the Venetians themselves, in spite of the recent lamentations over the fall of the Campanile, they seem to care nothing about it; the Technical Bureau has not one architect attached to its staff, and "art is absolutely subordinated to mechanical questions." We have long thought that, if we are to have "Venice Preserved," it must be got out of the hands of the Venetians; there should be a European combination to effect this; it would be worth a liberal expenditure to effect this object, for Venice is priceless, and there will never be another one. The record of some other cities is rather better; and though in Genoa "the utilitarian spirit prevails," the villa Schmidt, by Signor Parodi, of that city, is a really pleasing bit of modern architecture, neither imitative nor eccentric. An article on "A French Method of Cement Construction," by M. Jean Schopfer, is chiefly concerned with the illustration of the use of the Cottançin system by M. de Baudot in his church of St. Jean du Montmartre, about which so much has been said; and which, however well constructed it may be, will assuredly not assist in recommending the system from the artistic point of view; it is a hideous structure, with the proportions and appearance of cast-iron. This, however, is no inevitable result of the employment of the structural system in question; it is simply that M. Baudot, while professing to throw over precedent, has in reality been far too much under its influence. He undertakes to show how mediæval architects would have built if they had had the Cottançin construction to work with, and his method of doing this is to build a vaulted church on very thin supports; whereas, if such systems of structure had been available in the Middle Ages, vaults in the mediæval form would never have been built at all. The architect should have neglected mediæval forms entirely, and designed a church based on the best forms for the new construction; whereas he has taken just so much of mediæval precedent as serves to spoil his work, by presenting us with a kind of skeleton mediæval church the proportions and design of which, regarded from that point of view, are meagre and deficient in monumental character, and only serve to remind us how much finer a mediæval church is. Perhaps, however, indirectly this may have a good result, in discouraging the use of a system of construction which, though it may be very useful for mills and other such purely utilitarian erections, is, in our opinion, perfectly unsuitable for monumental architecture of a high class. An article on American systems of re-inforced concrete construction, which follows, takes for the most part the line of showing the use of this kind of structure in buildings merely utilitarian (and mostly very ugly), though we presume that the heavy piece of Classic architecture called the Nassau County Court House is constructed with re-inforced concrete, as its illustrations are appended to the article, in which, however, no reference is made to it. The article, by Mr. G. Hill, a member of the American Society of Civil Engineers, contains some practical details of interest; it seems rather out of date, however, to be told seriously in an architectural paper that a beam of concrete alone possesses considerable compressive strength, but "would fail by breaking on the tension side"; in a professional magazine this might surely be "taken as read." From this we jump to the purely æsthetic use of the order in architecture, in the description and illustration of Mr. G. B. Post's New Stock Exchange at New York, the front of which is a Roman Corinthian temple *in antis*, with a pediment and an enormous blocking and balustrade behind it. Why this should be taken as specially an example of the proper and logical use of the Classic order does not exactly appear, though we admit that the building may be taken as an example of that simple unity of conception which is one of the best qualities in architecture; but this would have been better brought out had a plan and section been added to the illustrations. An article on the French revival of sculpture in wax, by Mr. F. Lees, with illustrations of some charming work in this delicate material, ought to be interesting to sculptors.

The *Architektonische Rundschau* for this month contains hardly anything of special interest. The most important work illustrated is perhaps Herr Teichen's brewery building in Berlin, not a bad piece of work in itself, but one hardly understands the fancy for making a brewery look as much as possible like a military structure or a fortification, with machicolations and battlements as its dominant features. A house-front, No. 13, Bellevuestrasse, Berlin, by Messrs. Cremer & Wolffenstein, is picturesque in general appearance, but the details show the old German vices of interpenetrating mouldings, &c., and are in what in this country would be thought very poor and flimsy taste, though they still seem to have charms for German architects.

The *Monthly Review* contains an article by Mr. Halsey Ricardo on "The Betterment of London," not in the usual sense of improvement in the alignment of streets and public monuments, but in regard to the possibility of getting more of the beauty of colour into London. The main argument of the article consists in describing the colour element in Persian and other oriental forms of architecture, and in suggesting how a similar treatment might be applied to building in London by the use of structural polychromy, which is evidently what is intended, though that expression is not actually used Among other things, Mr. Ricardo suggests also that each parish should have its own established colour for such things as lamp-posts and area railings, which all have to be painted some colour or other; so that there should be uniformity of colour in each parochial division, and a stranger might be able to discover at a glance in what locality he found himself. This, as the author observes, is only carrying out further and on a larger scale the system of colour distinction already employed in London omnibuses. The idea is at all events worth consideration; but are there colours enough to go round? The same number contains the third instalment of Mr. Arthur Morrison's essay on "The Painters of Japan," and an article by Mr. Charles Bright, F.R.S.E. on "The Possibilities of Wireless Telegraphy." Mr. Bright, while admitting that we cannot as yet foretell all the possible results of wireless telegraphy, thinks that its inferiority to telegraph by cable is, at present, "as marked as would be the delivery of our letters on the pavement—to be picked up by any one—instead of in the letter-box." Cable shareholders may therefore take comfort, and need not regard copper wires, gutta percha coverings, and iron sheathings, as things to be shortly relegated to a museum of antiquities.

In the *Nineteenth Century* Sir Robert Hunter writes a valuable article on—or against—"The Inclosure of Stonehenge," accompanied by a plan showing what public paths are stopped by the present fence. Sir H. Hunter's view, however is much wider than the mere question of rights of way, though these partially affect the argument; it may be estimated from the following quotation, with which we entirely agree:—

"Can there be any better reason for the existence of roads, than that they lead to a place so remarkable that year by year it brings people many miles to take part in a gathering the origin and significance of which have passed into oblivion? Is it not idle, in the face of such facts, to suggest that there cannot be a public right of way to Stonehenge because its stones were placed there by man and may be removed by man? As a matter of fact they are older than anything else in the nature of a building which the British Isles can show. Removable they may be, but centuries have seen them standing in the same place, and centuries have seen them an object of interest and an object of resort. The megaliths of Stonehenge saw old Sarum grow into a great city, they saw it deserted, they saw its buildings fall to pieces, they have seen it for centuries a mere series of concentric earthworks; they have seen the new city of Salisbury (now old as British cities go) rise mushroom-like in its stead. If any structure of man can claim permanence, it is Stonehenge. If the public character of a road depended in any degree upon the permanence of the object to which it leads (as a matter of law it does not), assuredly no place could lay as good a claim to be a worthy terminus of a public road as Stonehenge. . . . The private ownership which is to be so tenderly respected is a figment of modern law. The public of this island had an interest in Stonehenge before any system of private land owning was dreamt of. The right of the public to approach it is far older than the right of the landowner to the soil on which it stands."

Naturally, Sir Robert Hunter sums up in favour of the substitution of legal for mechanical protection; in other words, of the purchase of Stonehenge for the nation. Among other articles in the same number are "The Fabric Fund of Westminster Abbey" (apparently a somewhat ideal quantity), by Miss Bradley; and "The Exhibition of Early Flemish Art in Bruges," by Miss Mary H. Witt.

In the *Pall Mall Magazine* Mr. Archer, so well known as a specialist on railway subjects, writes an article on "Fast Trains," the main object of which is to open the eyes of English readers to the fact that we are being beaten by the French in the matter of fast trains, and to consider how and why this is. He admits that this rivalry is of very recent date, and also that it is only illustrated by a few special trains; the general average of speed on French railways being still much below that of English lines. But the French seem to have wakened up to the commercial advantage of high speed on through express routes, and Mr. Archer draws attention to the type of engine with which this work is done—the De Glehn foir-cylinder compound, with leading bogie, and four or six driving-wheels coupled. "The heating surface of the boilers of these mammoth locomotives is much larger than that of their British contemporaries, and the steam pressure also is higher." But the most important point mentioned is that these French express locomotives, with their high steam pressure and coupled "drivers," are unsurpassed for the ease with which they can mount banks (a "bank" in railway parlance is anything in the way of an ascending gradient), which obviates the necessity of running at high speed down hill. This is surely a wiser policy than that of slow speeds up hill with a tremendous run down the declivities, such as is practised on each slope of what is known as Shap Summit on one of our Scotch routes, and which in our opinion may some day lead to a fearful catastrophe; the slightest unexpected defect in either road or engine might do it. On this head Mr. Archer's article should have the attention of railway men. Mr. Marillier contributes an article on "The Electric Lighting of St. Paul's"; and Mr. Herbert Paul one on "The New Order of Merit" and the men who have received it. We agree that the most interesting of these are the one artist and the two authors among the number—Mr. Watts, Mr. Morley, and Mr. Lecky. Mr. Paul makes some suggestions as to others who might have been worth the Order, and while remarking that there is no reason why the Order should be confined to one sex, says, "we have no female astronomer like Mrs. Somerville, no female economist and historian like Miss Martineau," &c. The latter we may admit, but as to the astronomy, is Mr. Paul, a man of the world and for many years an eminent journalist, really unacquainted with the name of Miss Clerke?

The *New Liberal Review* contains an article on "The Legal Position of Trades Unions," which, without being intended so, is rather amusing reading. The main subject of the article is the result of recent well-known judgments fixing legal responsibility on Trades Unions for acts of coercion and combination. While the author is obviously a friend to the unions, he tells them plainly that they cannot well escape from the meshes of the new law, and that their best and in fact only course is not to transgress it. The remarks on the present state of the law as regards what used to be facetiously called "peaceful picketing" serve to show at any rate that the practisers or supporters of this time-honoured weapon of persecution recognise that their hands have become pretty securely tied. The writer (Mr. Anton Bertram) asserts indeed that a "free labourer" on his way to a job, is now "hedged about with an almost greater sanctity than an ancient tribune of the Plebs"; and certainly it would seem that some of the modern interpretations of the Statute of 1875 (the words of which he quotes) seem to render it rather difficult to speak to the "free labourer" at all without coming within the wind of the law. It was high time, however, that something were done to put a stop to the shameful abuses connected with picketing, and the ill-temper of the Labour

party under the enforcement of the law is a practical proof that such strong measures were necessary and are having their effect. What one does not understand is, how such "picketing" tactics as have been carried on down to only a very short time since could ever have been allowed when such a statute as that of 1875 was in existence. Had the law become a dead letter, or had no judges or magistrates the courage to enforce it? In the same magazine an article on "Antiquities, Old and New," by Mr. Ralph D. Blumenfeld, criticises in clever and trenchant style the successive crazes for different kinds of antiquities—a particular style of furniture, a particular form of engraving, &c., whereby things that originally were worth pounds are sent up to hundreds of pounds. The writer has a good deal to say, also, about the constantly increasing trade in spurious articles which dogs these crazes, and which we imagine has arrived at a development little suspected by the general run of purchasers and collectors. Furniture is one of the easiest classes of articles to produce in sham antique, and we recommend the following remarks to the purchasers of this class of antiquities :—

"Half the chests of drawers and writing-desks that one now sees in old shops are made up from odd pieces of old furniture without a particle of new wood or metal in them, so that after all they are not altogether fraudulent. In those parts of the country which are frequented by tourists, particularly Americans, one finds that the making of spurious antiquities is a most thriving trade. A good many cottagers in the country lend themselves to this profitable business. The American lady in search of treasure spies a beautiful oak chest in the wide-open room of a wayside cottage. A yearning for its possession overcomes her, and the poor woman, who vows it is the only link with the past that is left to her, parts with it for a good round sum. Three days later another and similar chest stands in the same place. That is called 'salting,' and the cottager takes her fair share of the profits from the maker, whose workshops are situated in the nearest town. At Rouen the trade of 'salting' has become a fine art. There are enough ancient grandfathers' clocks in this town to have sufficed for every family in France a hundred years ago, and still they are being made at the rate of a hundred or more a day."

Under "The Field of Art" *Scribner* gives a most useful article by M. Alexandre Sandier (a translation probably from his French) on the history and development of the Louvre as an art museum, accompanied by plans showing the dates of the various portions of the building and the general classification of the collection. The article is to be concluded in the October issue of *Scribner*. In the same number is a lively article on "Prix de Rome Students at the Villa Medici," past and present, which throws an amusing light on the humours of a life of what may be called æsthetic Bohemianism which can hardly have its counterpart anywhere else.

In the *Century* an article on "Civic Improvement in Street and Highway," by Mr. Sylvester Baxter (with illustrations by Jules Guérin) adds another to recent indications of the manner in which attention to this subject has been awakened in the United States. The author justly remarks, in a practical spirit, that, in dealing with the improvement of streets and highways, "improved construction of the road-bed is the first consideration." While observing that "the good-roads movement" has become widespread in the States, he feels obliged to admit that "the average American highway is still perhaps the worst to be found in any really civilised country." It is a curious thing how the standard of road-making and maintenance varies in different countries, and that each country, considered as a whole, is pretty sure to have either all the main roads good or all of them bad. Thus there has been for a long time in France a high traditional standard of road-making, probably dating in the main from the liberal and (in this respect) enlightened policy of Louis XIV.; though, as far as we have evidence, the streets in Paris remained in a very bad state long after the "grandes routes" had been brought nearly to perfection. The United States seem to have started from the first with a tradition of bad road-making, which has been so persistent that the nation is only just beginning to awake to the necessity of improvement in this respect. Readers of the date when "Uncle Tom's Cabin" was a popular book may remember Mrs. Stowe's description (obviously from fact) of what was called in her day a "corduroy road" in the States, which consisted of logs of wood laid crosswise, like railway sleepers, on a mud foundation, such a road forming a portion of the only available route by which a certain Senator could reach the seat of Government. We presume "corduroy roads" no longer exist, but it is significant that in the early part of last century such public roads could have existed under an otherwise energetic Government. The attention which has been paid to brick for road-paving in America is explained by Mr. Baxter's reference to districts in the West "where the character of the soil makes dirt roads impracticable and macadamising materials are scarce," and where the introduction of brick pavements has laid the foundation for an entire regeneration of the civic character of a town. This one cannot be surprised at; it is impossible to imagine a dignified town architecture on either side of what is called a "dirt road." From another passage we gather that there seems to be need of firmer by-law legislation in American cities; as the author, while remarking on the advantage of setting back the houses and leaving some greenery between them and the street line, complains that the effect is spoiled by commercial structures being built out to the street line. Apparently the idea of an officially guarded "frontage line" is rather a new one in the States. Two suggestions emphasised by illustrations are worth notice. One is the view of Beacon-street Boulevard in Brookline, Mass.: where the space for the double tracks for electric tram-cars is kept not in the middle of the road, but on a wide margin of grass lawn along one side of the road, the rails being laid through the grass, which of course is quite uninjured by the passage of horseless cars: a row of trees is planted along the borders of this green space. This is a new and admirable idea, whereby the necessary space for the tram-car tracks is made to add to the picturesque appearance of the road, instead of only making an arid paved desert in the middle of it. The other example is that of Essex Woods-road, near Manchester-by-the-Sea (also in Massachusetts), where, the road having been made through a tract of woodland, a strip of this has been secured in perpetuity along each side of the road, so as to preserve the sylvan character of the road, even though the rest of the land may be cleared for building. This also is a hint worth bearing in mind.

*Harper* contains an article on "Epochs of Gem-engraving," by Mr. Maxwell Sommerville, Professor of Glyptology in the University of Pennsylvania. It is a short article; a merely suggestive sketch of the outlines of a great subject, but illustrated by engravings of some remarkable examples of cameos and intaglios. The most curious of these is that which forms the tailpiece to the article, an intaglio on sardonyx illustrating the days of the week, better explained, he says, in French than English; though this is only partially the case, for the figure of Saturn is better explained by "Saturday" than by "Samedi," and that of Helios better by "Sunday" than by "Dimanche." On the other hand, we have the figure of the moon, "Luna," answering to "Lundi"; that of Mars answering to "Mardi"; Mercurius represents "Mercredi"; Jupiter answers to "Jeudi," and Venus to "Vendredi"; and here the record is certainly much closer in French than in English. It would have added to the value of the article if the writer had given us the provenance of this and other examples illustrated, and their present whereabouts; to say that this is "one of the most curious intaglios ever found" at once suggests the question, by whom found, and where? to which no answer is given, nor is the date suggested in the case just mentioned, though it is in some other cases. Are we to understand that the illustrations are all from the author's own collection? If so, he must have been an able or a fortunate collector. The same issue contains an article on some of the scenery and castles of "Stevenson's Country," with some fine sketches of Tantallon and Prestonpans castles, and bits of Fifeshire scenery. Tantallon Castle should hardly have been mentioned in connexion with Scottish literature without a reference to Burns's remarkable use of it as a symbol of endurance, in his complimentary verses to a Scottish poet—

"The teeth o' Time may gnaw Tantallon,
But thou's for ever."

The *Revue Générale* contains an article by M. Pierre Verhaegen, "De la Restauration des Monuments Anciens," a subject not often treated in foreign reviews. The author takes what may be called the moderate common-sense view of the subject, distinguishing between buildings which are ruined and those which, while ancient and in need of repairs, are still buildings in use, such as churches and old mansions and town-halls, which he calls "monuments vivants," and which he considers should be repaired, restored, or added to as is demanded for their use to-day, without too great a regard for the past. In regard to buildings of which a portion only is left, in a ruined state, he propounds a rather doubtful thesis, viz., that after the archæologist has arrived, by a close study, at the real meaning of these remains and the indications of what were formerly the portions now entirely perished, it is allowable to restore these latter, as documents of explanation for the general public. The answer, of course, would be that they are not documents, but only suppositions, and liable to error. Make drawings of the obliterated portions, if you like, to show what the building may have been when entire; but do not put anything on the site itself. As to the claims of a building, originally in one style, to be disencumbered of later and incongruous additions, the author quotes the following from a French or Belgian writer, M. Cloquet :—

"Un édifice remis à neuf, dans l'unité de son style primitif, semble creé d'hier, il a perdu sa saveur, son caractère instructif et touchant en même temps que l'authenticité de ses lignes. C'est là un point de vue respectable, mais non le seul à envisager. Cette considération a, il est vrai, une importance majeure. Si l'unité de style est une règle capitale dans un monument neuf, la conservation des apports des styles successifs peut, dans un monument ancien, être plus intéressante que l'unité d'aspect. Pourtant, l'esthétique du monument a aussi ses droits légitimes, et peut avoir une importance de premier ordre pour les édifices bâtis d'un seul jet dans un style très pur. La pensée n'est jamais venue qu'on puisse tolérer et maintenir des adjonctions ultérieures troublant l'harmonieuse pureté d'un temple grec de la belle époque de Périclès; et un autel de la Renaissance, fût-il ancien, serait, au même titre, insupportable dans la Sainte-Chapelle de Paris."

There is a great deal of truth in this, and we quote it, because it represents a point of view almost entirely overlooked and even contemned among English writers on the subject.

In the *Gentleman's Magazine* an article on "London in Verse," by Benvenuta Solomon, collects together a good many quotations in which London has at different times been described by poets or versifiers. There are some which are not well known; on the other hand the author has missed a very fine passage from Joanna Baillie, which deserves citation in any such collection. The writer seems, from one passage, to be quite unaware that the church in Covent Garden is a building of any particular note, and in another place apologises for quoting Herrick, apparently regarding him as an obscure poet, but assuring us that there are many pretty things in his works; so we may take it that she (for we presume "Benvenuta" is a lady's name) is not quite in touch with current thought on art and literature.

## COMPETITION FOR POLICE-COURTS AND FIRE-STATION, SUNDERLAND.

MR. J. S. GIBSON, A.R.I.B.A., the assessor in this competition, having made his report, the drawings were exhibited to the public on Saturday and Monday last in the reception-room of the Municipal Buildings, Sunderland.

The site of the proposed buildings is an L-shaped one, which presented some difficulties in planning by reason of its peculiar disposition. The site was also obstructed by some property which has not yet been acquired by the Corporation. Competing architects were required to submit alternative plans, showing in one case their plan on an unobstructed site, and, in the other case, showing their buildings so disposed as to avoid the obstructing buildings. Most of the competitors have done this, but others have taken for granted that the obstructing buildings will be eventually acquired by the Council, and have not unnaturally abstained from planning alternatives which would never be carried out.

The north leg of the L, which the instructions indicate is to be reserved for the police and sessions court buildings, and which faces to a fairly wide street called Gill Bridge-avenue, is bounded on its northern and longer side by a large field, which is used by the local

volunteers as a drill ground, and which is not at all likely to be built upon or indeed used for any other purpose than the present one. Competitors were told that there was right of light over this field.

This opportunity of making an elevation to the open garrison field has been seized by very few of the competitors, while only one or two have endeavoured to give a complete architectural treatment of the two sides and the obtuse angle formed by them as seen in combination. Most of those who have thus treated their design have united the two elevations by a circular corner feature, tower or dome.

In considering the plans one cannot help noticing one or two mistakes which have been made by most of the competitors, thus spoiling in some cases otherwise good plans. The arrangement of the cells in connection with the charge and parade room in most cases leaves much to be desired. The Prisons' Board Regulations require that the cell-corridors shall be directly commanded by the charge-room, but only one or two drawings show even a portion of the cells so commanded. The return of the fire-engines is a point which has not been satisfactorily solved by the majority of the competitors, nearly all of whom have planned their engine-sheds so that returning engines cannot be taken directly into their places, but must pass behind the other engines standing in their places; while the sheds are shown so narrow that such passing would be either inconvenient or impossible.

The first premiated design is "Order," by Messrs. W. & T. R. Milburn, Sunderland, and Messrs. Wills & Anderson, London, which gives plans of police-courts and fire-station, with alternative plan of fire-station showing the obstructing buildings avoided. An elevation is shown fronting to Gill Bridge-avenue, while the permanently exposed flank to Garrison Field is left with a plain elevation. Sunderland is not noted for the beauty of its public buildings, and the elevation shown in this design, which will, in all probability, be carried out, will not tend to raise the standard. The treatment is of a rather stiff Renaissance character, but without any prevailing idea. The plan reveals several defects. The entrances to the sessions and police-courts, the public entrances to the galleries of the courts, the magistrates' entrance, and the entrance to the police station, are all placed close together at the north end of the site, in such a manner that on a busy day there will be an awkward crowding at this point, and magistrates, witnesses, solicitors, &c., will have to fight their way through an assemblage of the usual police-court loungers. In this plan the cells are arranged in two groups, separated by an airing yard. One of these—the female group—is placed close to the charge-room, and its corridor is directly overlooked therefrom, but the other—the male group—is placed some distance from the charge-room, and totally cut off from any supervision therefrom, while the end of its corridor is lighted by a window directly overlooking a public back street.

The charge-room is cut in two by a long counter or desk, but has no connexion with the clerk's office, with which it ought to communicate by a window for the booking of charges. This clerk's office is, instead, placed almost at the further end of the building, and adjoins an enquiry office, which instead of being near the entrances, as one would expect, is at the end of a corridor some 80 ft. or 90 ft. away, in a position which will make it not easy to find by one unacquainted with the building.

The Police and Sessions courts, with their accessory office, take up the whole of the first floor. Here, again, the planning leaves much to be desired in the way of convenience. Take the position of the grand jury room, for instance, which should be in close connexion with the Sessions court. It is not only on a different floor, but is at the further end of the building, and has the Police court between it and the Sessions court. Thus, to get from the grand jury room to the Sessions court one has to pass along a corridor on the second floor, on which it is situated, descend a flight of stairs, and then proceed along some 80 ft. or 90 ft. of first-floor corridor, passing the rear of the Police court and the area dividing the Police and Sessions courts. Adjoining the Sessions court is a room marked "Jury Retiring-Room," which is presumably for the use of the common jury, but is without means of entrance or exit except through the Sessions court or the Indictment office.

Although less exception can be taken to the plan of the fire brigade station, it is open to the objection of inconvenience in arrangements for returning fire-engines, common to most of the plans. This difficulty with returning engines is, no doubt, the outcome of the peculiar shape and position of the site and its approaches. Another objection may be raised to this plan, as well as to most of the others, in the placing of the superintendent's house, so that it does not in any way command the rest of the buildings.

To "Lex," Messrs. Stones & Stones, Blackburn, and Mr. W. Edward Sprout, Glasgow, has been awarded the second premium. An elevation is shown to the garrison field, as well as to Gill Bridge-avenue, and the angle formed by the two is well and effectively treated. This is shown in a beautifully executed perspective. With regard to plan, although the plans are so crowded on the sheets that they are somewhat difficult to follow, the general arrangement of the various suites of rooms seems very convenient, and would no doubt work well. Perhaps the greatest objection can be taken to the arrangement of the cells, which are in four groups on the ground, mezzanine, first and third floors, and thus cannot all be overlooked from the charge room, but are so commanded on the ground floor only. Here, too, the clerk's office is too far away from the charge room, while the magistrate's entrance is placed too close to the public entrance to the courts. In the fire station plan the objections to return arrangements for fire-engines, and the position of superintendent's house, apply as in the winning plans.

"K. C." (Mr. Alfred Corbett, Manchester), shows a heavy, prison-like treatment of the exterior, with very plain elevation to Garrison Field, and no attempt to mask or treat architecturally the obtuse angle at the north-east corner. In this plan the charge and parade rooms are entirely separate apartments, the former being somewhat too small for the purpose. The clerks' office is placed on the opposite side of the corridor, and thus, though nearer to the charge-room than in the two previously mentioned plans, is not quite near enough for practical requirements. The female cells are placed on the ground floor, and the male cells on the mezzanine above, and lighted from an airing yard 6 ft. wide. In neither case is the corridor overlooked from the charge-room as it ought to be. The Indictment and jury rooms are better placed than in the winning plan, while the sections show a very effective treatment of the interior of the courts. A very neat elevation is shown to the fire-station buildings, but is marred by the treatment of the large flat-topped hose tower. Here, again, the return of the fire-engines is inconvenient, but the superintendent's house is better placed for commanding yard and buildings than in the two previous designs.

Three very good designs are submitted by "Justice"—Messrs. Joseph & Smith, Blackburn, Mr. E. A. Lloyd, Revidge, and Messrs. J. & H. Aspinall; "Firebrand," Mr. F. E. Coates, Sunderland; and "Doric," Mr. Frank Caws, Sunderland, any of which would have looked and worked well if carried out.

"Justice" shows a very effective elevation, with central entrances and low domes at either end of the principal elevation. The cells are well under command of the charge-room and the courts and their accessories are conveniently arranged. The drawings are well got up, with, perhaps, the exception of the perspective.

"Firebrand" shows a very effective elevation with a well-designed tower, and the plans are well worked out and conveniently arranged.

"Doric" gives a very good plan in the form of a great semicircle, which is both convenient internally and effective externally. The latter effect is shown in a well-drawn perspective. The elevations are good though quiet, perhaps too much so to show well on paper. The plans show the cell corridors and exercise ground thoroughly overlooked by charge-room, while the clerk's room adjoins the latter and communicates with it by a window through which the charge may be booked. The plan of the fire station shows a very convenient return way for engines, by which each one can be returned to its place without interfering with the rest. The dormitory and recreation rooms also have numerous communicating poles to engine sheds, as have also the married firemen's dwellings, and the superintendent's house has complete control of the station works, yard, and entrance.

"Spero," Mr. G. Spencer Hoffman, London, shows a well-drawn set of plans and elevations, but is defective in the lighting of the police-court, having only one large three-light window at one end to light the whole court, some 60 ft. long. The elevations are well designed, and there are two well-drawn perspectives.

Another very good design is "Ad Rem," Messrs. Jas. Henderson and John Hall, Sunderland. The front elevation to Gill Bridge-avenue, the north-east angle, and the flank to Garrison Field are well treated and adapted to the site, the angle feature being a projecting entrance hall surmounted by a low dome flanked by two smaller domes, the proportions of which might perhaps be improved in working out.

Messrs. Mitchell & Raine, London, submit a good design, with a stencilled lion as motto, which is somewhat wanting in convenience of plan, but shows very effective elevations and interior treatment for the courts. It is accompanied by two well-drawn and effective perspectives. In this, as in one or two other plans, the police dwellings are shown fronting to a narrow back street, which is widened by giving up a strip of the site to this street. In view of the somewhat slum character of this street, this does not recommend itself so well as the method most of the competitors have adopted of making the dwellings face to the drill-yard.

Messrs. G. T. Brown and Jos. Spain, Sunderland, sent in a neatly got up set of drawings with a red cross as a motto. The elevations look very pretty on paper, but seem wanting in dignity. In the plan of the fire station the married firemen's dwellings are placed the full length of the drill yard away from the engine shed, which would he inconvenient in working. In the police-court buildings only a portion of the cells are overlooked by the charge-room, while the conveniences are placed in the corridors as in the plans signed "Lex."

"Black Friar," Mr. T. Sington, Manchester, shows an elevation in the style of a mediæval castle, with numerous small octagonal turrets, totally at variance with modern ideas, and indifferently drawn.

"Light," Mr. Arthur Stockwell, Newcastle, sends a very good plan. All the cells in the police buildings are well overlooked from the charge-room, but have the disadvantage of being lighted through outside walls.

"Vivat Rex," Mr. Wm. L. Edwards, Birmingham, and "Bee," Mr. Ernest Hazell, London, exhibit very good treatment of elevations, neatly and well drawn.

## ISOLATION HOSPITALS.*

IN the choice of a site the same principles apply as in the case of any building where people wish to live the healthiest possible lives, and in many towns it is really difficult to find such a site. If the ideal ground is not available, the arrangement and construction of the buildings upon it must be such as to make the most of, and, if possible, improve the natural advantages already existing. In this country the conditions to be aimed at are a warm, dry soil, with good water supply and outfall for drainage, a proper means of sewage disposal, as much open space around it and as much sun and air and quiet as possible. The best combination of accessibility and isolation are particular requirements. But, in any case, the site must be large enough to contain all the buildings required at proper specified distances one from another and from the boundaries, and to admit of future extension whenever it may be required, or for temporary wards should they be needed in a sudden emergency of epidemic.

We may divide isolation hospitals into three classes:—(1) Large urban hospitals; (2) hospitals of a smaller class serving a smaller town or country district; (3) small isolation wards connected with a large institution, e.g., asylums, workhouses, &c. The first and last of these will almost certainly be in the vicinity of other buildings, the second may and should stand perfectly free in the open country.

However small or simple an isolation hospital may be, it contains in its principle of

* Part of a paper to be read this week by Mr. Percy Worthington, M.A., A.R.I.B.A., before the Sanitary Science and Preventive Medicine Section of the Sanitary Institute Congress, Manchester.

arrangement and of construction the germs of larger and more complicated buildings, and in materials and details, so far as they go, there should be no difference whatever. Let us, therefore, to begin with, take a simple form of hospital and examine the points to be observed in its plan and construction. In districts where only a small number of beds is required, it is not necessary to make any considerable provision for subdivision of diseases. Small isolation rooms in connexion with the larger men's and women's wards will probably be sufficient. But if more than, say, twenty beds (ten men and ten women) are needed, the consideration of subdivision will come in; distinct buildings will then be required for the treatment of diseases. Let us take a hospital for fourteen beds—seven men and seven women.

The administration will be in the centre, dividing the men's and women's sides, and connected to each by an isolated corridor, and containing accommodation for matron and nurses, a doctor's room, reception-room (which will probably also serve for discharging patients), a bathroom, stores, and offices, with kitchen and its offices at the back. Behind, in a detached building, will be the mortuary, ambulance-house, and disinfector, with boiler-house, coal stores, &c. For dealing with infected linen and clothes a galvanised iron tub on wheels will be found most useful, which should stand just outside an opening convenient for receiving the infected things and with an arrangement for turning boiling water and disinfectants into it. Everything can then be removed at once to the disinfector. The wards on each side are approached from the administration by a corridor, which should have a disconnecting lobby or covered way open to the air between the administration and the other buildings. From these, either side of the hospital may be approached directly without passage through the administration buildings, and each side will contain a ward for six beds with a kitchen adjoining and dividing it from a single ward, or perhaps two, for isolating cases from the larger ward. The kitchen should have a small range for keeping food warm, boiling milk, &c., a sink with hot and cold water supply, and a ventilated cupboard for keeping food and milk, and it must also have means of supervision of the larger and smaller ward through windows opening into each. There will be a store for ward linen, &c. Convalescent rooms are, perhaps, a luxury in a small hospital. As much opportunity as possible should be given for throwing corridors completely open to the air.

Separate sanitary arrangements cannot be provided, and are not needed for the small wards, but those for the larger wards should be in detached blocks and separated from them by cross ventilated lobbies with a door at each end, so as to form complete cut-off passages. The bathing and washing arrangements should be in a separate block from the water-closets and nurses' sinks, and both should be slightly warmed to a lower temperature than that of the wards by pipes in connexion with the hot water service. A similar means may be adopted for keeping linen stores properly aired. One water-closet to ten patients is sufficient, and adjoining should be the sink-room for slops, washing ward utensils, &c., and out of this should open a private nurse's water-closet. The sanitary blocks should be lined with glazed bricks or tiles; if the former, narrow division bricks, known as Shepwood bricks, make strong and thin partition walls. The divisions need not go up to the ceiling, and thus cross ventilation may be obtained by windows on opposite sides. In the smallest hospitals fixed baths are not always required, a movable one being alone provided. But this is not a very desirable arrangement. The best baths for hospital use are probably vitreous enamel baths, which are now made by many firms, and which, while having a lasting surface similar to that of a stoneware bath, are much less costly, and, being made of metal, get heated at once instead of remaining cold like stoneware.

As to the space to be given to each bed, the following are the figures generally accepted:—Cubic space of air per bed, 2,000 cubic feet. Floor space per bed, 144 square feet. Wall space per bed, 12 ft. lineal between centre. The figures give a ward 24 ft. wide, a little under 14 ft. high, and of a length according to the number of beds, each additional bed adding 12 ft. to the room. In a single bedded ward the height of 14 ft. gives a room 12 ft. square, or 14 ft. by 10 ft. These rooms may, with advantage, be made rather larger, and a height of 12 ft. 6 in, or 13 ft. is quite enough. In a hospital of this type the wards should be not at right angles with the remainder of the building, so that one side wall against which the beds are placed is partly an interval wall, but so that the interval wall is the end of the ward, and so that a window may be placed between each of the beds.

Small isolation wards will be required in most large general infirmaries for a few beds for men and women, especially in districts where mining and other accidents of a similar nature are frequent. They afford the means of isolating infectious disease should it occur, pending its removal to an infectious hospital, but will be chiefly useful for the treatment of septic cases.

The moderate sized hospital for larger rural districts will consist (1) of an administration block which must either be built large enough in the first instance to suit further extension, or so planned that a definite idea of the necessary additions is laid down in the original plans, a proviso which applies also to the arrangement of the ward blocks and to the laying out of the site generally. The administration block contains the accommodation in the hospital previously described upon a suitable scale, with a dispensary and rooms for a caretaker and his wife, who will look after the hospital if it is empty, and be qualified to help in it when it is occupied, or a separate cottage may be erected. In addition to the receiving-room, a detached discharging-room should be provided with bathing facilities and clothes storage, &c. The administration block will be near the entrance, but so placed with regard to the wards as to render service as convenient as possible, for food will have to be prepared here and distributed to the wards, with which there may be connexion by covered ways open at the sides.

In the country it should never be necessary to build the wards of more than one story, but, as before mentioned, the site should be adapted to considerably more ward accommodation than is built at first. The men's and women's sides must be completely separate, and pavilions erected for the treatment of separate diseases, so that no two may be located in the same room. A small single ward in a pavilion may be safely used in case of an isolated case, even in the same block with other diseases, if due precautions are taken. But it is not desirable. In this climate it is only in very exceptional summers that we get too much of the sun, and the wards must therefore be planned so as to catch the most useful sunlight all the year round, and the axes of the wards should therefore be north-east and south-west. The planning of the wards will be upon the same principle as those previously described, the number of beds in each being determined by the needs of the locality and the convenience of nursing.

It is recommended sometimes that all wards should be built upon arches, so that there is a clear air space underneath open to the air, as there is above and around. The idea is plausible, and from a constructional point of view permissible where a hospital ward is of necessity raised a man's height above the level of the ground, and the space below cannot be usefully occupied. On very sloping ground, where the wards must be connected by corridors, this sometimes happens in order to avoid unduly steep gradients in the corridors, but never in an infectious hospital where the buildings are completely detached and will be adapted with terraces each to its own position. Unless the arched space is high enough to walk about in, it only becomes a receptacle for all kinds of refuse and rubbish, and, even then, unless properly attended to.

There still remain those large urban hospitals to which different conditions apply, and where the details of administration become considerably more complicated. Here we shall require more wards and further subdivision, and besides them the following buildings:—(1) a receiving block, (2) discharging block, (3) porter's lodge, (4) quarters for the resident medical staff, (5) quarters for matron, nurses, and servants; (6) kitchens and stores so placed that they are central and convenient for the service of the whole establishment; (7) dispensary; (8) block containing boiler house, disinfector and destructor, mortuary, and post-mortem rooms, ambulance sheds and stables, and conveniently situated with regard to the boilers, washhouses, and laundries for the patients and the staff. It is probable that the wards may have to be of more than one story. Their axes should be north-east and south-west, and no two wards, either on the same or different levels, should have communication by closed passage, stair, or lift with one another. The pavilions may be connected by open covered ways, but everyone must have its access direct from the open air.

In a large hospital which is continually occupied, it is necessary to allow the wards in turn to lie empty or fallow for a time, and therefore this must be taken into consideration in the number of wards required. The rooms attached to each ward, which should not contain more than twenty to twenty-four beds, will be more in number than in the previous types examined. In addition to a ward kitchen there will be a room for the sister in charge, and probably two separation wards, one adjoining and inspected from the ward kitchen, the other from the sister's room. The supply of these rooms should be liberal, as they may be used not only for cases which require separation from the general ward, but also for private paying patients, whose number will probably increase rather than diminish in the future, though they should not be allowed to encroach upon the primary object of such a hospital, *i.e.*, the isolation and nursing of the sick poor. Still the objection does not apply in the case of an infectious hospital to the same extent as in a general infirmary, since isolation is a protection to the public. The sanitary blocks will be of the same character as those before described, but in proportion to the number of beds, and containing a small room for the retention and examination of excreta, with a sink in a ventilated cupboard. Circular wards are not unsuitable for infectious purposes.

The materials used should, of course, be as absorbent as possible, and their surfaces hard, smooth and easily cleaned, with no holes or corners for lodgement of dirt, dust, or germs. Probably nothing is better for walls and ceilings than Portland cement or adamant, or for the floors than terrazzo; all floors should be of solid concrete. Terrazzo is apt to crack if laid in the ordinary manner, but this may be largely prevented, and it is probably better for the purpose under consideration than any wood-block floor. There is, however, a wide difference of opinion about this; but, if a wooden surface is adopted, the blocks (oak or maple for choice) should be thoroughly well seasoned, and great care should be taken as to the atmospheric conditions under which they are laid. All external and internal angles to walls, floors and ceilings, should of course be rounded, and raised borders should run along the lateral walls of the wards to keep the beds off the walls, and in one-story wards and on the first floor of two-storied blocks, the ceiling may with advantage be curved if the proper ventilation is secured at the highest point.

The windows should, up to about two-thirds of their height, have double hung sashes, the lower half with a deep bottom rail to allow of the admission of air at the meeting rails without draught at the bottom, or so as to fall inwards as a hopper, the sides of which are closed in by projecting casings filling up the angles flush with the wall face on their inner side. Above the sashes is a transom dividing them from three hoppers, one above the other, which open and close with gearing worked by a key in possession of the nurses. The doors should be upon the same principle, the place of the sashes being taken by the doors, and the ventilating hoppers in both should be carried as near the ceiling as possible. The doors of all rooms should be glazed in the upper part for light and easy inspection. Wooden floors should be wax-polished, and other woodwork varnished, and cement walls painted and varnished. Fireplaces in the smaller rooms are probably best made of salt-glazed or faience ware, very simple and without mouldings, and the ward fireplaces should be considered as a part of the scheme for their warming and ventilation.

The ventilation of one-story wards in an open position is, of course, simpler than that of wards of more than one story in a town atmosphere, and probably doors, windows, and effective types of roof ventilators, and of central stoves, will serve the purpose best. Ventilation must, of course, always be carefully considered in connexion with any artificial heating introduced apart from the stoves. If a certainty is to be made of effective

ventilation without draught in all sorts of weather, there is no doubt that mechanical means must be adopted, and that warmed air must be admitted and the vitiated air extracted by fans through flues in the walls. The atmosphere of manufacturing towns is not what we should wish to admit to a hospital, and attempts are often made to cleanse and warm or cool the incoming air in basement chambers, and thence pass it through ducts into the rooms. In hospitals this seems to me a bad thing. Its costliness is no objection if it is the best method, and if the money is available; but it entails grave defects, to my mind, as applied upon a large scale. The air admitted to the wards is not of the pleasantest or healthiest nature, and the excessive length of ducts for inlet and outlet, inaccessible, and sure to collect dust and germs after considerable use, become sources of danger. It is quite possible to arrange the extraction of foul air at the ceiling level, and at one point, so that the shaft is of comparatively short length, straight and large enough for a man to get into for cleaning purposes. But it is impossible to heat a large ward satisfactorily upon this principle with only one inlet, and it is the multiplication of the flues that is, to my mind, undesirable. On the other hand, the system is quite applicable on a small scale, *e.g.*, for the warming and ventilating of an operating-room, provided that the greatest care is taken to secure the means of cleaning and disinfection.

In country districts water and sewage will be difficulties. The former will, of course, be one of the first considerations in the choice of a site, and without it no hospital can be erected.

## *COMPETITIONS.*

MUNICIPAL BUILDINGS FOR CREWE.—The Crewe Town Council, in response to invitations for competitive designs for the new municipal buildings, received forty-five sets of plans. Messrs. Woodhouse & Willoughby, of Manchester, were the appointed assessors. The first premium has been awarded to Mr. Henry T. Hare, London, and the second has been divided between the following:—Mr. Albert Dixon, of Leeds; Messrs. Banister Fletcher & Sons, of London; and Messrs. Rodney & Denning, of Bristol. The estimated cost of the new buildings is 14,000*l.*

POLICE BUILDINGS, SUNDERLAND.—A meeting of the Sunderland Watch Committee was held on the 4th inst. for the purpose of meeting the assessor in regard to the plans for the new police buildings and fire-station, which are to be built near the baths in Gill Bridge-avenue, at a total cost of 30,000*l.* The Corporation offered premiums of 100*l.*, 50*l.*, and 25*l.*, for the three best plans, and twenty-five plans were sent in. Some of them were for buildings of a more expensive character than the Council proposed to build. The award was as follows:—1st, "Order," Messrs. W. and T. R. Milburn, Sunderland, and Messrs. Wills & Anderson, London, joint architects; 2nd, "Lex," Messrs. Stones & Stones, Blackburn, and W. Edward Sprout, Glasgow; 3rd, "K.C.," Mr. Alfred E. Corbett, Manchester.

DRAINAGE, EATON BRAY, BEDS.—The open competition amongst sanitary engineers for the drainage of Eaton Bray, Bedfordshire, has resulted in the plans prepared by Mr. J. R. Elliott, A.M.Inst.C.E., of Nottingham, being selected, and he has accordingly been appointed engineer to carry out the work. There were fifteen schemes submitted.

TOWN HALL, DURBAN, SOUTH AFRICA.—At a recent meeting of the Durban Town Council a report was read from the Borough Engineer on the requirements of the new Town Hall, which is estimated to cost from 200,000*l.* to 250,000*l.* The building is to be erected in the Town Gardens, and will occupy, with the museum, library, and art gallery, a space 250 ft. by 170 ft. The building is to consist of three floors and a sub-basement, and will comprise a large hall to accommodate 3,000 people, also a supper-room and lecture hall, occupying 21,600 square feet, the library, museum, and gallery to take 44,000 square feet, and the municipal offices, &c., 27,900 square feet. Competitive plans are to be called for. It is suggested that a competent assessor should be appointed to select six designs from the first competition, and that the authors of the six so chosen should send in fuller plans and specifications for the final award. The premiums offered are to be 500*l.* for the first, 300*l.* for the second, and 200*l.* for the third.

# Illustrations.

## ST. JOHN'S CHURCH, SIDCUP.

THE original church, consisting of a broad nave, and crypt, was built in 1844, and was known by the name of the East Chislehurst Church. The first alterations were made in 1875, when the cloisters which surrounded three sides of the church and the galleries at the west end were removed, and the ground floor space reseated. In 1882, Mr. R. J. Withers, architect, was consulted with reference to further additions, and plans were submitted for the entire rebuilding of the church, but only a portion of the scheme was carried out, namely, the chancel, with a small chapel on the south, and vestries on the north side, and one bay of the west end. No further additions were undertaken till the latter part of 1898, when Mr. George H. Fellowes Prynne, of Queen Anne's-gate, Westminster, S.W., was consulted. It was decided to abandon the late Mr. Wither's design, and except as regards the chancel, which it was determined to keep, Mr. Fellowes Prynne was instructed to prepare designs for a new church, with tower, embodying the existing chancel and vestries. The plan of the new church consists of a broad nave, 30 ft. wide by over 105 ft. in length, giving accommodation for 510 adults, north and south transepts and aisles, and south chapel, with accommodation for 311. This, together with the choir, and possible extra seats in the church, shows a total accommodation of over 900.

The tower is placed at the west end of the south aisle, and its ground floor space is designed to form a baptistry.

The main entrances are placed at the west end of the nave and north aisle, while north and south entrances are placed midway between the transepts and aisles. Very considerable alterations and enlargements have had to be made to the old vestries, giving far better accommodation generally.

Externally the architect felt bound, to some extent, to carry out the somewhat simple architectural style and treatment of the existing chancel, but internally red brick and stone are used freely. The tower, with its copper-covered roof, will rise to the height of about 140 ft.

The architect's main difficulty was to work in the old chancel to prevent its appearing small and commonplace, in comparison with the larger and somewhat more ornate new nave. This he has endeavoured to do by putting in an entirely new chancel arch, and raising it to the highest limit, and increasing its breadth as much as possible, and then splaying the ends of the nave wall to meet the jambs of the chancel arch. The splays are enriched by niches, brackets, and canopies, which are designed to be placed with figures of the twelve Apostles and Archangels.

The nave is divided into six bays, the columns and arches rising to the height of 20 ft., the wall plates 32 ft., and the apex of the barrel-vaulted roof 45 ft. from the nave floor level. The roof is stained green, the ribs and cornice being picked out in a cream-coloured rope pattern. This gives a very rich and light decorative effect. The transepts and aisle roofs are treated in a similar manner. The chancel screen, which forms an important decorative feature in the church, is carried out in Corsham Down stone, with green stone shafts, the lower panels being filled with gold mosaic, and much of the stonework richly carved. Sculptured figures representing the four Archangels stand in niches over the main piers. The gates and grille are of rich wrought ironwork, and the centre portion of the screen is surmounted by a wrought-iron grille and cross rising almost to the apex of the chancel arch. This wrought ironwork has been carried out by Messrs. Percy Bacon & Bros., of Newman-street, W.

The work has been carried out by Messrs. Goddard & Sons, of Dorking; and the carving is the work of Messrs. H. H. Martyn & Co., of Cheltenham. The heating, which is by the hot water low-pressure system, has been carried out by Messrs. J. Jones & Sons, of Farringdon-street, E.C. The total cost of the church was about 11,500*l.*

## PORT SUNLIGHT CHURCH.

THE church at Port Sunlight, which is now in course of erection, is situated in the centre of Port Sunlight village, on the banks of a small ravine, in which formerly ran a tributary of the river Mersey, called Bromborough Pool. The church is to be built of red sandstone, from the Helsby quarries; the inside wall and piers are also of the same material. The roofs will be covered with green Westmoreland slates. The accommodation is for about 800, with room for augmenting this number on festival occasions. The nave will be 104 ft. long by 30 ft. between the arcading with small side aisles. In addition, there will be two large transepts, an organ chamber, choir vestry, clergy vestry. The choir and chancel will be 48 ft. by 26 ft., accommodating a choir of forty. The roofs are open timbered of pitch-pine, left untouched. The building is being carried out by the Building Department of the Company, under the superintendence of the architects, Messrs. William and Segar Owen, of Warrington.

## HOUSE AT WOLVES NEWTON, MONMOUTHSHIRE.

THIS house is now in course of erection on a site overlooking the valley towards Abergavenny and the Sugar Loaf mountain, a distance of about twenty miles.

The entire walls are of stone and are externally covered with white rough-cast. All the external woodwork, main staircase, and interior of billiard-room (which has an open timber roof), is to be of oak. The bays to dining-room and staircase are in Bath stone. All the window frames are of massive oak construction, fitted with wrot-iron casements and fittings. The roofs are to be covered with red Bridgewater tiles.

A special feature will be made of the entrance hall, the staircase being carved to a special design, and the walls panelled to within 2 ft. of the ceiling. This ceiling will be panelled out in oak, with wrot-iron electric pendants. The first floor contains ten bedrooms, two bathrooms, and offices.

As the ground falls rapidly to the valley, it is proposed to treat the garden by a series of terraces and Dutch gardens.

The contractors are Messrs. E. Turner & Sons, of Cardiff, who are also the contractors for the other buildings and cottages in connexion with this work. The perspective was drawn by Mr. Sydney Castle.

Mr. A. Jessop Hardwick, of Kingston-on-Thames, is the architect.

## SANITARY INSTITUTE CONGRESS.

THE nineteenth Congress of the Sanitary Institute was opened at Manchester on Tuesday last with a reception of the members, who in all exceed 2,000, including over 1,000 delegates of municipal, sanitary, and other public bodies, by the Lord Mayor of Manchester (Mr. Alderman Hoy). The reception took place in the Town Hall, among the leading members present being Sir Frank Forbes Adam, Sir Wm. Bailey, Professor G. V. Poore, Dr. Wynter Blyth (Chairman of the Council of the Sanitary Institute), Dr. C. Childs, Dr. Armstrong (Newcastle-on-Tyne), Mr. White Wallis (Secretary of the Institute), Alderman Radman (Mayor of Salford), Dr. Maclure (Dean of Manchester), and others.

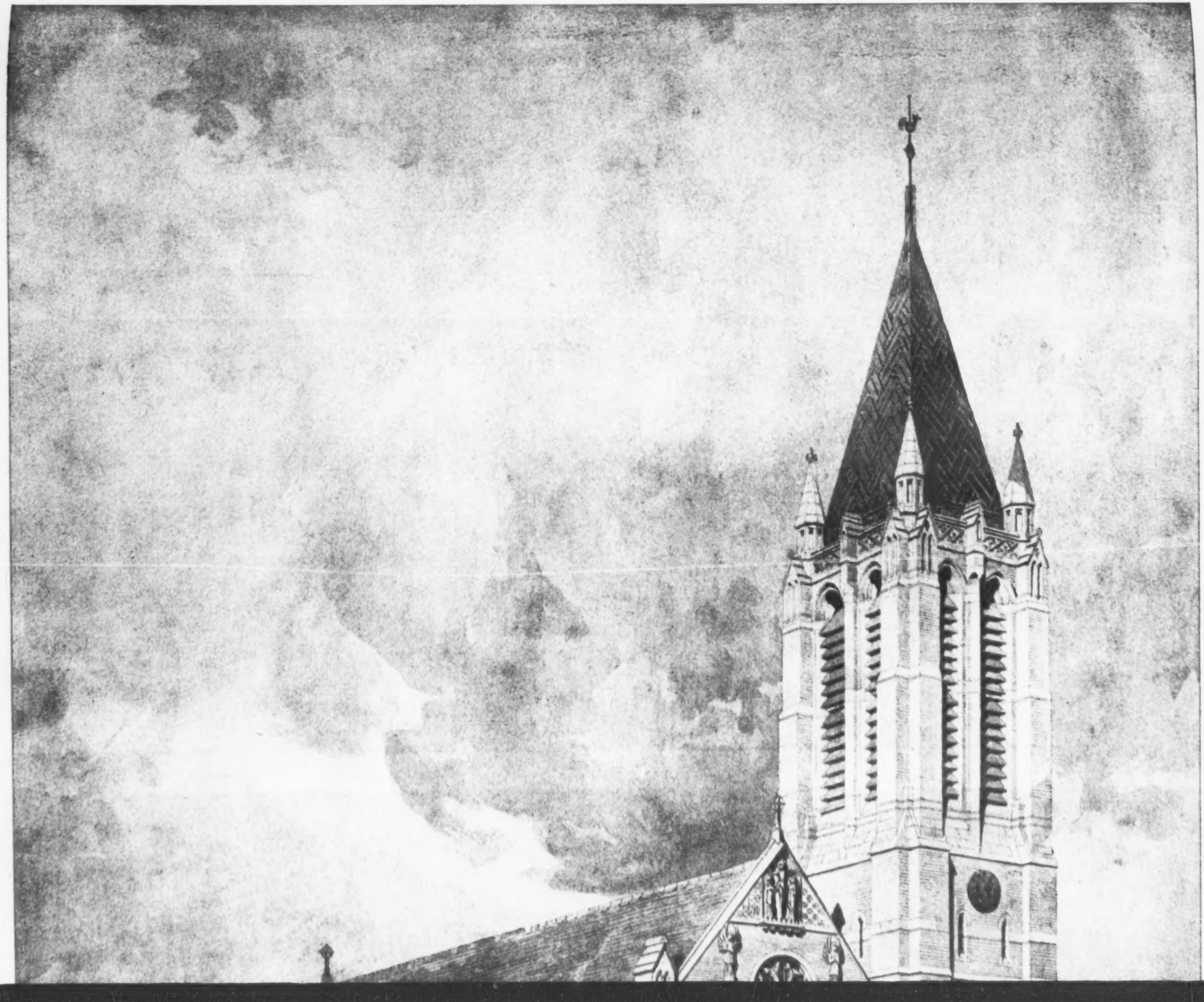
The reception was followed by a luncheon at the Grand Hotel, and by the opening of the Health Exhibition organised at St. James's Hall, the Lord Mayor of Manchester presiding at both functions.

Before formally declaring the Exhibition open, the Lord Mayor appealed to his fellow-townsmen to take a deeper interest in municipal affairs. Every civil community was benefited by the existence of a sound and discriminating public opinion, and nothing stimulated public opinion more than taking an interest in municipal affairs. Municipal institutions were the outcome of the general feeling of the community, and if Manchester or any other town lagged behind in good work, it was the fault of the ratepayers.

### *Presidential Address.*

In the evening Earl Egerton of Tatton, the President of the Congress, delivered the inaugural address in the Whitworth Hall, Owen's College, before a very large gathering of members of the Congress. After welcoming the members of the Sanitary Congress to Manchester, Lord Egerton said that as a simple landowner responsible for dealing with the dwellings of the poor and the buildings and farms on a private estate he

THE BUILDER, SEPTEMBER 13, 1902



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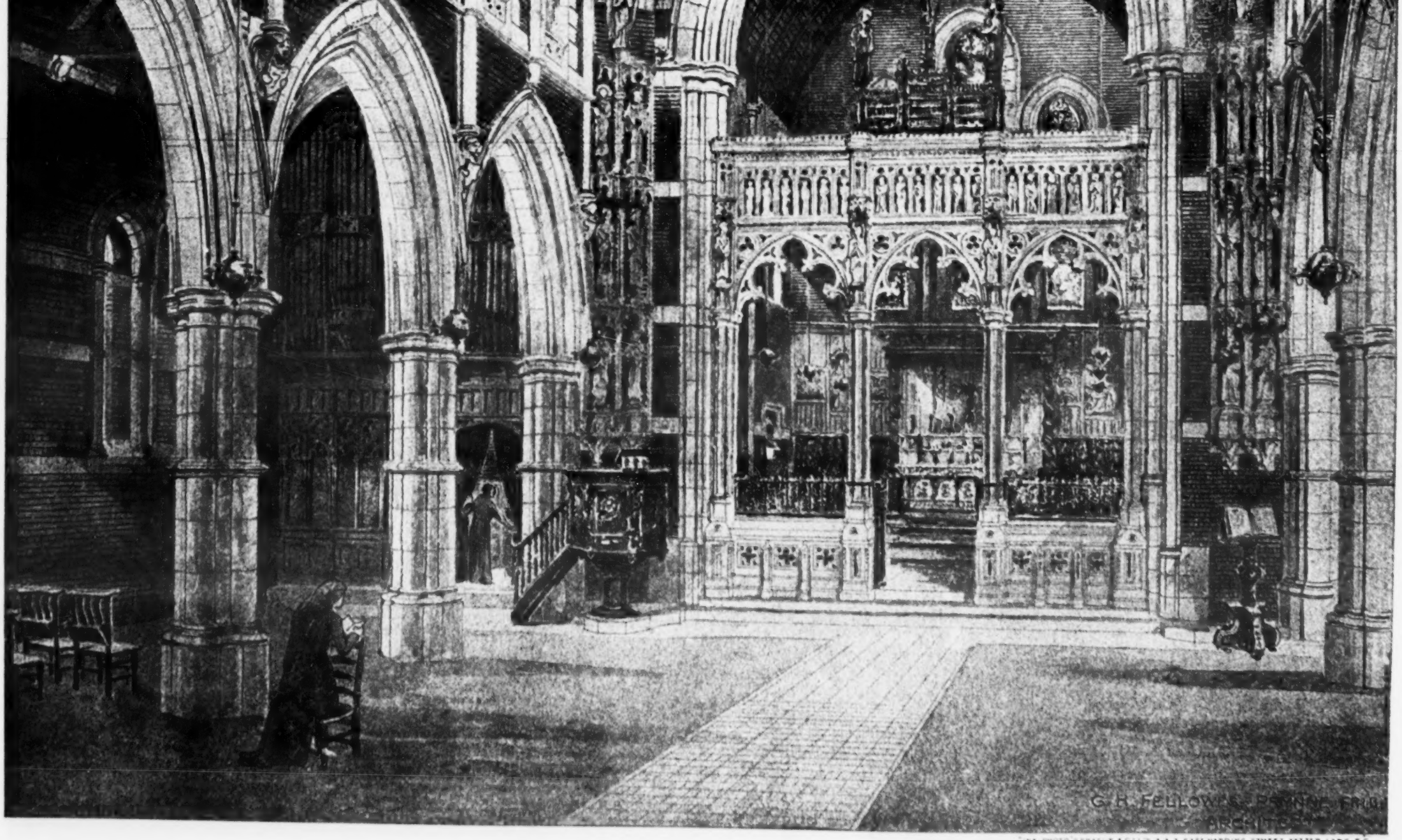
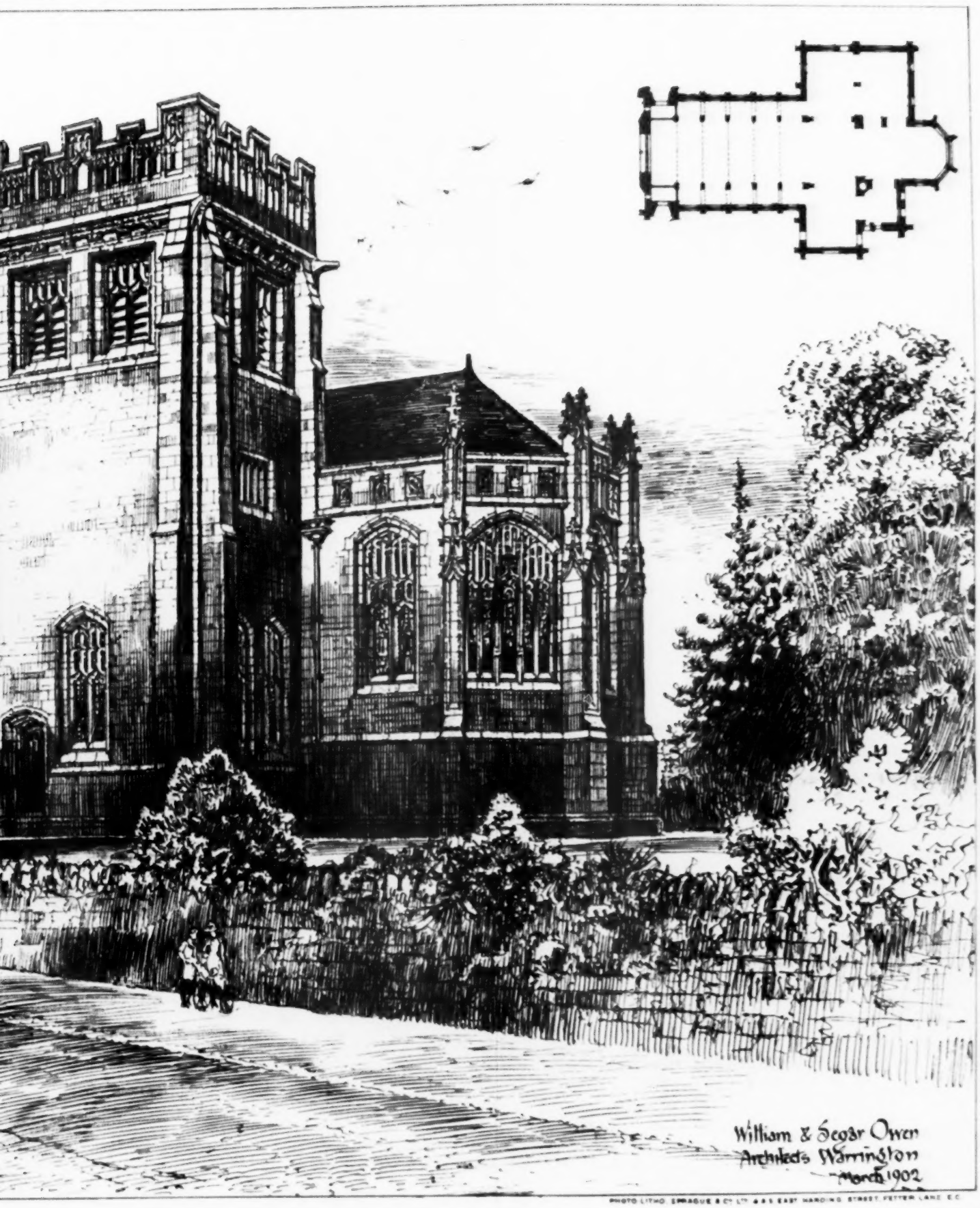
PROPOSED NEW CHURCH OF ST. JOHN THE DIVINE, SIDCUP.—Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., Architect.




PROPOSED NEW CHURCH OF ST. JOHN THE DIVINE, SIDCUP.—Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., Architect.

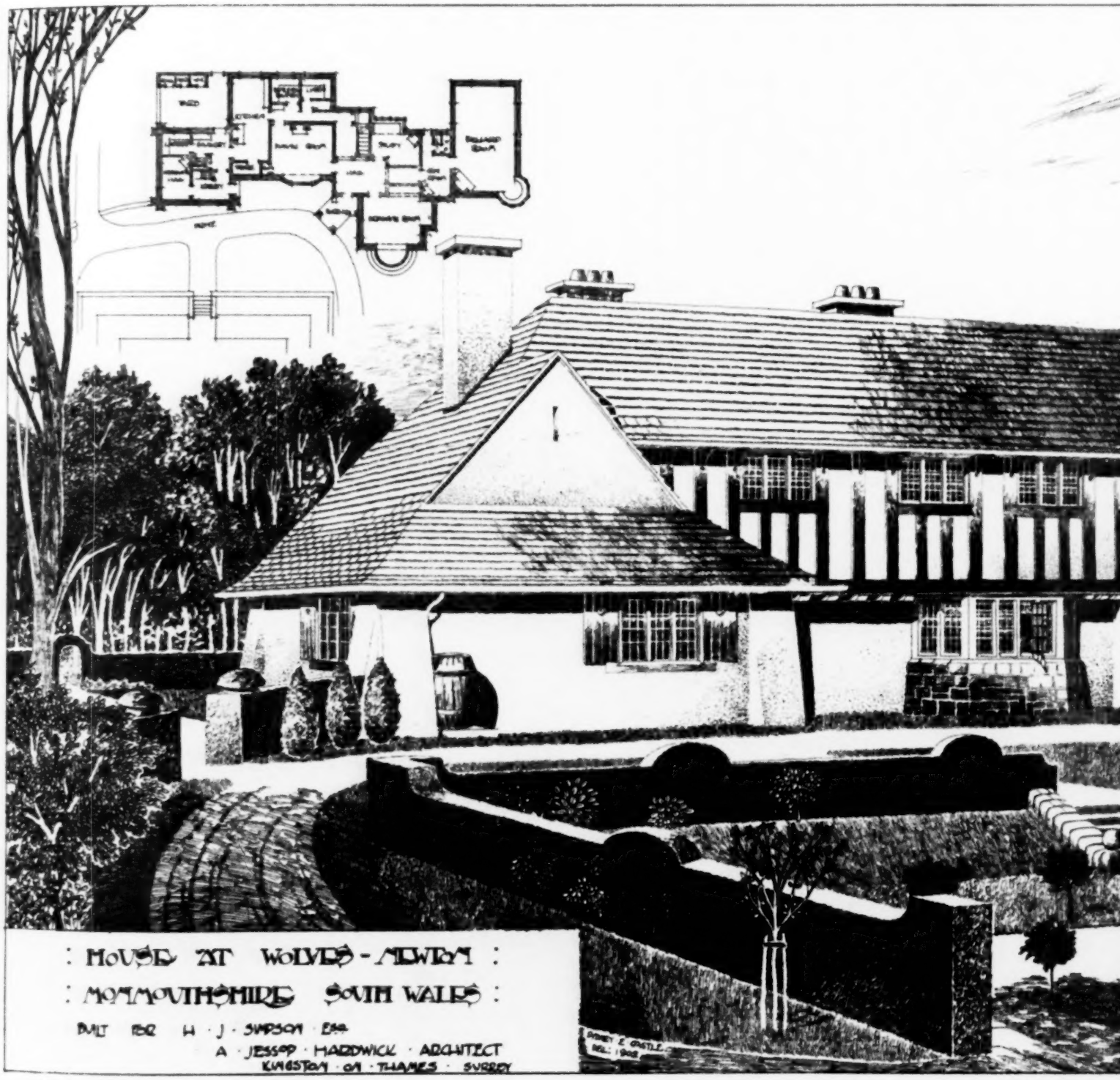
INTERIOR VIEW, LOOKING EAST.

# Proposed Village Church
## Port Sunlight Cheshire
### For Messrs Lever Bros Limited



William & Segar Owen
Architects Warrington
March 1902

PHOTO LITHO EMBAGUE & Co LTD 444 EAST HARDING STREET FETTER LANE E.C.



: HOUSE AT WOLVES-NEWTON :
: MONMOUTHSHIRE SOUTH WALES :

BUILT FOR H. J. SIMPSON ESQ.
A. JESSOP HADDWICK. ARCHITECT
KINGSTON ON THAMES. SURREY

SEPTEMBER 13, 1902.

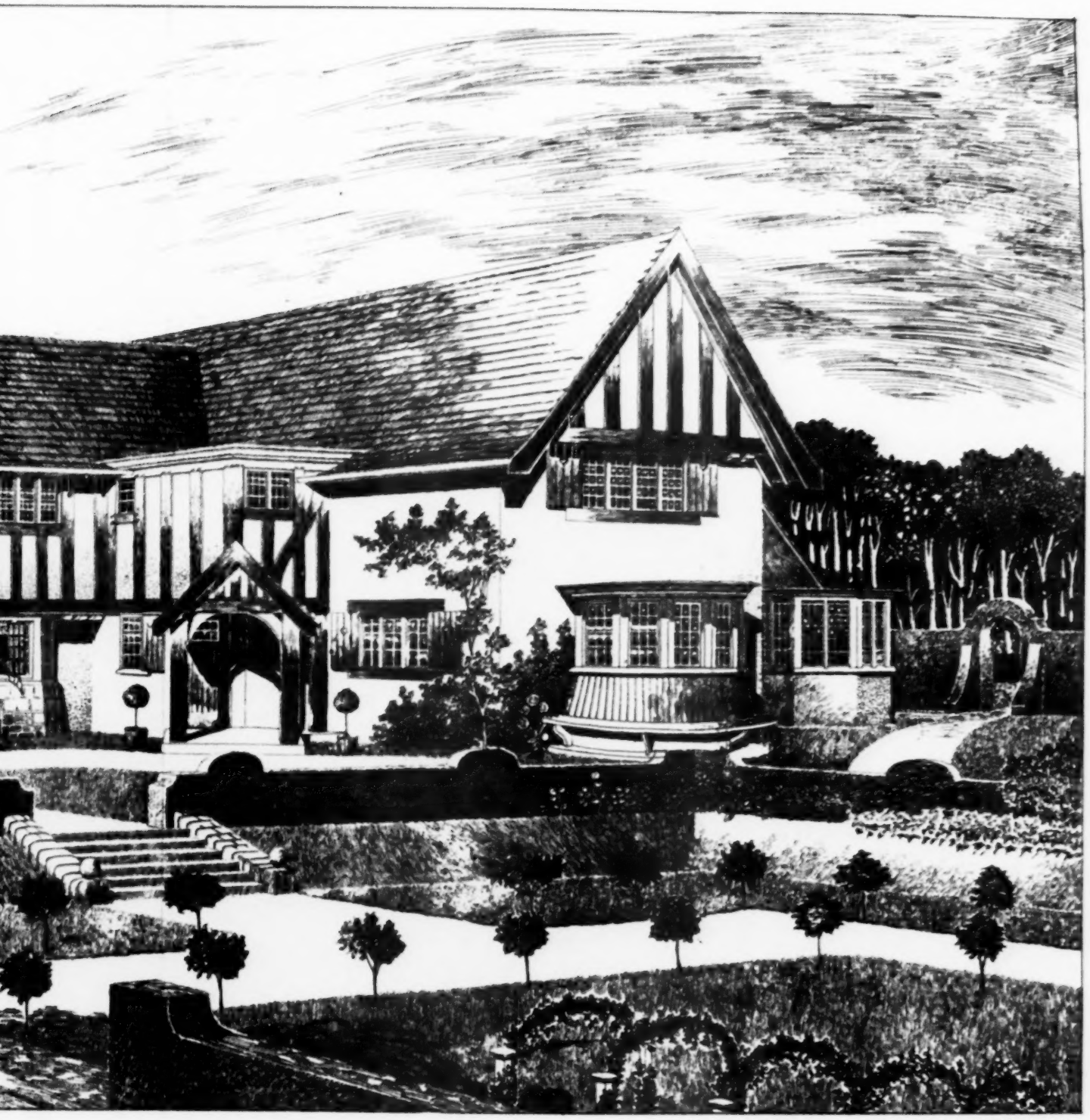


PHOTO LITHO. SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

could certify to the great sanitary improvements which had been made in cottages, farms, farm buildings, and water-supply, within his recollection, but he felt that we had been hardly sufficiently alive in rural districts to the storage of our rain-water. In towns, and not least in Manchester, the water-supply, the prevention of pollution in rivers, and the measures necessary to improve their purity, had been much more effectively dealt with. Manchester, proceeding on broad and simple lines, had constructed a network of sewers the total length of which amounted to 1,700 miles, the total cost of the system, which served a population of more than 1,500,000 persons, having been upwards of 600,000*l*. When the sewerage works and the purification works in progress were completed, the total capital expenditure would amount to 1,300,000*l*. The outlay by manufacturers, who, through the successful efforts of the Joint Committee of Lancashire and Cheshire, had been encouraged to co-operate with local authorities, had been considerable—probably not less than 300,000*l*., and the improvement of the river water when used for manufacturing purposes had been an important benefit. The manufacturers in those counties felt that all similar traders in the kingdom should be compelled to treat their sewage in the same way. Great as had been the triumphs of engineering of their great city, the population in it and other large centres was degenerating, a fact recently made evident by the large percentage of rejections from physical disabilities among young men offering themselves as recruits to the army. To arrest this deterioration, by greater care in the physical education of the young, and by teaching them the principles of hygiene and the preservation of health, was one of the great problems with which we were confronted. He hoped that the Congress, by its deliberations, would pave the way to such a regeneration in our fellow-countrymen as would ensure their not falling behind our competitors, either in Europe or America, by any decay in our race.

*The Conferences.*

The sectional deliberations of the Congress began on Wednesday with a series of eight Conferences of municipal representatives, engineers and surveyors, medical officers of health, port sanitary authorities, sanitary inspectors, veterinary inspectors, hygiene (a conference of ladies), and school hygiene.

The Conference of municipal representatives was opened with an address by its Chairman, Mr. Alderman McDougall, Vice-Chairman of the Sanitary Committee, Manchester. In the address, the operations were reviewed of various committees of the Manchester Corporation charged with the water supply from the great waterworks at Longdendale and Thirlmere; the works for the interception and purification of sewage at the Davyhulme works; the utilisation of the refuse and street sweepings on the extensive estates at Carrington Moss and Chat Moss, and the works at Holt Town, and the control of the condition and the up-keep of the highways and streets; the provision of parks and open spaces and baths. Many other points in municipal hygiene were touched upon, chief among them being the prevention of pollution of the atmosphere by smoke, the Housing Act of 1890, the substitution of compulsory for permissive powers, and the substitution of electric traction for horse-power on tramways.

With regard to the latter subject the President of the Congress said that in Manchester the substitution of electric traction for horse-power on the tramways is progressing rapidly, facilitating transit from the densely populated portions of the city to the outskirts, with the additional sanitary advantage of reducing the amount of offensive matter on the streets.

*The Public Health Acts.*

The President of the Conference having briefly acknowledged a vote of thanks accorded to him, a paper was read by Mrs. F. Greenwood on "The Mortality of Infants under Five Years," and then Mr. W. H. Wells was called upon to read a paper on "The Necessity for Reconstruction and Consolidation of the Public Health Acts." Some of the absurdities resulting from defective definitions and omissions from the Public Health Act, 1875, particularly with regard to cellar dwellings, were set forth in the paper with the object of reawakening the desire ardently expressed in many meetings of sanitarians for a revision and consolidation of the Public Health Acts. The Public Health Act (1875) proscribed as living rooms the use of rooms below the ground level unless the following conditions were all fulfilled:—Interior height, 7 ft.; height of ceiling above the ground outside 3 ft.; an area the whole length of the front of a minimum width of 2 ft. 6 in. In the conditions nothing is said about cellars which may have dimensions largely in excess in one direction, and much more sanitary than a typical cellar that would be passed as habitable, if in some other direction the measurements fell short. Instead of 2 ft. 6 in. wide the area might be 10 ft. or 11 ft. wide, but if the ceiling was only 2 ft. 9 in. in place of 3 ft., it would not be passed, though the latter would be far more sanitary than the former. The area might therefore be widened by several feet, and much more light and air be let in, but in doing this, ground higher by a few inches might be left outside, and it might through the very improvement be taken out of the habitable class and put into the condemned class, which presented an evident absurdity. Section drawings attached to the paper showed four types of habitable cellars, and four which would be condemned, the conditions in the latter being in every case far superior. Another figure showed how the legal defect might be rectified. He also suggested the disuse of the term "cellar," of which there was no proper definition in the Act. In the 1891 Act the word "room" had been substituted, but this had not much mended matters. Another defect pointed out referred to the enormous amount of litigation and loss caused by the ambiguous use of the words "drain" and "sewer" in the Amending Act of 1890. In the case of a row of houses drained by one drain running on private premises from yard to yard, and finally discharging into a public sewer, that drain remains a "drain" if the houses are owned by more than one owner, and as such must be kept in repair by the several owners, but if the whole row belongs to one man, the drain becomes a "sewer," and must be kept in repair by the ratepayers generally. In other words, if a number of comparatively poor men each own a house, they must pay for their own drain repair, but if one rich man own the lot, his fellow ratepayers will do the work for him.

After a discussion, in which Dr. Boobbyer (Nottingham), Hon. Secretary of the Conference, Alderman Huddart (Salford), Alderman Griffiths (Southport), Mr. Wells, and the Chairman joined, several amendments to a resolution suggested in the paper were brought forward, and eventually a resolution in the following form, proposed by the chairman and seconded by Dr. Boobbyer, was adopted by the Conference:—"That this Conference recommends the Council to take into serious consideration the necessity for the consolidation and revision of the Public Health Acts, and to urge the Local Government Board to take immediate steps to bring the matter before Parliament."

## SOME POINTS IN MUNICIPAL SANITATION.*

DURING the spring and summer, indeed all the year round, except during wet weather, the work of preventing accumulations of dust on the street surfaces and its being blown about is one that adds greatly to the comfort of the inhabitants, and, possibly, to their healthfulness. The form of paving considerably affects the quantity and nature of the dust formed. On metalled streets the quantity is much greater than it is on granite or wood paving, but the composition of the dust is different. On metalled roads the grinding action of wheels is so very much greater than on paved roadways that a proportionately greater amount of dust is formed. In this connexion, the practice of making wagon wheels for paved roads and for metalled roads of the same width of tyre is decidedly wrong: the initial pressure that granite can bear without abrasion or displacement is so much greater than the smaller stones forming the surface of a metalled road can carry, that it is only reasonable to ask that the corresponding pressure should be spread over twice the area, and that the wheel tyre should be made twice as wide, at least, as those made for paved streets. On a wet day one has only to listen to the noise made by the crushing of road metal by the wheels of a heavily laden wagon to understand how both dust and mud are formed by the undue pressure from narrow tyred wheels.

This action of light and heavy vehicle wheels during a high drying wind, on a hot day, however efficient the watering arrangements may be, makes it impossible to prevent dust being blown about in large quantities. At one time we had only the butcher to consider, or any shopkeeper who kept open house; then the streets might be made sloppy without any one making complaint, but with the march of civilisation came the bicyclist, and with him fresh complications. We may not admire the position in which he rides—like a mark of interrogation turned the wrong way—but we are compelled to listen to his protest against making the roads too wet; and his argument that the shopkeeper should expose his goods inside glazed windows to avoid damage from dust—that, in fact, the roadway is his and not the shopkeepers—has some reason in it. The bicyclist, in his mad career, may not always breathe through his nostrils, but I have known some of them breathe slaughter against the wetter of roads, after one of those most sudden of all experiences—a side slip. Someone has suggested oil instead of water for this troubled state of affairs, and doubtless before long some better medium than water may be found for laying street dust, for the necessity for so doing is greater than is generally realised.

It has been found that children, and even adults, moving from an inland town to the seaside, as is the custom during the summer, often experience throat trouble, in some cases developing asthma during the first few days of the change. This was attributed by a medical man to the irritation set up through inhaling salt particles blown about with dust, and it is but reasonable to suppose that other illnesses may be caused by the highly polluted dust from town streets.

If this subject has not already been investigated, as it probably has, it is one worthy of being done under the auspices of the Royal Institute of Public Health, when means may be found for dealing with it, for it cannot be contended that the present methods are satisfactory.

The next point is one closely related to the preceding, for the dust of to-day may be the mud of to-morrow, or *vice versâ*, and the conditions are completely changed. Here, again, the form of road surface has its influence. On paved roads mud is mostly an accumulation, whereas on metalled roads it is much more; and although dust shows to some extent the wastage of such road surfaces, the quantities of mud that have to be removed from roads where there is a heavy traffic makes it much more evident.

There are more discussions in meetings of Councils on the question of mud than on almost any other: it comes up annually, but the means of its complete prevention have yet to be devised. On metalled roads, especially after fresh metalling, during the prevalence of fine drizzling rain, a thin coating of mud forms, and, however frequently it is brushed off, so long as that form of rain continues this fine mud batter is again quickly formed. This kind of mud will choke the gully gratings, and yet be too liquid to allow of its being shovelled into the mud waggon; the hoofs of passing horses scatter it indiscriminately and to considerable distances, and the offside of the pedestrian, if he keeps to his proper side of the path, is spotted in this way. Now that the question of which century we are living in has settled itself, some time might be devoted as to how to mitigate this state of affairs, for the evil is not confined to Provincial towns.

In places like Exeter, where all the main streets have metalled roadways, and where the traffic is heavier than such roads should have to carry, the removal and disposal of the mud formed is at times a serious difficulty. The distances it has to be carried prevent its being taken up as quickly as it should, and if deposited within the district an unsightly mess is formed. It was for this reason that I tried washing the mud in an ordinary sand washing box to recover the grit removed with it, and the easier to dispose of the stuff. It was found in some cases that three loads of mud when washed left a load of grit, and in this way large quantities have been recovered. This grit is the very best for stuccoing or mortar

* Part of a paper read by Mr. Donald Cameron in the Engineering and Architecture Section of the recent Congress at Exeter of the Royal Institute of Public Health.

making, and finds a ready sale. As the formation of dust and of mud is so similar, the cure for the one might answer for the other. On sanitary considerations, mud, except for the discomfort caused by it, appears less objectionable than dust, and yet much mud is carried into houses on clothing, where it is brushed off as dust.

The last points to which I wish to claim your attention are those of sewerage and sewage disposal. The history of sewerage in this country, as shown by the earlier sewers in Exeter, should be one of great interest to the engineer who can trace the evolution of ideas on the subject. One of the most apparent changes between the sewers of sixty years ago and those made to-day is the difference in their capacities; otherwise they are much alike, except that pipes of stoneware or concrete have taken the place of brick. On these old sewers manholes are provided at intervals, and at the junction of streets, the shafts being carried to within a few feet of the surface, and there was a tradition that it was the intention to have brought them all to the surface, finishing in ventilated covers; this was not done owing to the opposition of the foreman over the city workmen, who objected, on the ground that they were prospectively likely to cause a nuisance.

The question of to-day in connexion with a sewerage scheme is whether it is to be of the combined or separate systems. Under some conditions the separate system is desirable, but it is an open question whether, all round, the sewerage that takes a definite amount of rain, and even storm water, is not the most desirable, and also if, in some cases, the separate system can always be confined to the special part assigned to it. The Local Government Board has fixed the quantities to be dealt with before storm sewage can be allowed to overflow. The whole subject is complicated, but it seems somewhat absurd that at disposal works storm sewage should have to be continued to be dealt with, while several times the volume of that treated, but of precisely the same character, should go by overflow in the water courses.

Even with six times the normal flow of sewage the contribution of each branch sewer to the intercepting main is usually only a fraction of what that branch sewer has to carry. That dilution helps in the treatment of sewage bacteriologically there can, I think, be no doubt, and for domestic sewage, were the volume increased by the addition of water thirty times it would be rendered innocuous, as was shown by Dr. Dupre, and for this reason the addition of rain water is desirable. It is also desirable that the washings from road surfaces should be kept out of water-courses, especially the washing caused by heavy rain after a spell of dry weather. The main idea is, first to deal with what is real sewage, and, in addition, with the first wash of the sewage of a heavy rain. The arrangement of the sewerage scheme should be to obtain these conditions at the disposal works.

The only system with which I will take up your time now is my own, or the septic tank, and the automatic arrangement for delivering the effluent to the filters. Looking back, and benefiting by experience, had I to do it again, another name would have been given to the system, for it is evident that the word "septic" does not find favour with medical men, although to men of that profession is due the first favourable opinions of the system.

In Exeter it has been shown that a domestic sewage can be brought into such a condition that the greater part of the solids in suspension can be broken up and liquefied, and that the resulting effluent can be filtered by artificial filters. That this filtrate can by successive filtrations be brought to any desired degree of purity, and this without the aid of chemicals. The same thing was shown to be possible with the manufacturing sewage at Yeovil—in its way, probably, one of the foulest in the country. In Manchester, with an undoubted trade sewage, a septic tank and single filtration gave better results than when the sewage was twice filtered. The chemist and manager of the sewage works finds that higher nitrification can be obtained by treatment in septic tank, followed by contact filters, than by any other method. It has been found that with domestic sewage over 80 per cent. of the solids are liquified, and with a trade sewage 50 per cent., and in all cases the tank deposit is in a finely divided condition, easily pumped, and although producing gas freely, it has little or no offensive smell. When in the proper condition for removal from the tank it very much resembles China ink when mixed in the dish.

As you may be aware, there are great variations in the sewage of one town throughout the day and week, and that the sewage of no two towns is alike, and the treatment of the sewage of each town requires similar variation.

In Exeter the best results were found when the sewage remained in the tank from eighteen to twenty hours. The tank is capable of dealing with large variations in flow without injury, so much so that provision need only be made for the dry weather sewage, and a tank of that capacity will be sufficient to cope with the usual allowance of storm sewage also. Although the sewage of a town varies in composition from hour to hour, the tank has an averaging influence, or a "smoothing effect," as Dr. Rideal put it, which gives some constancy to the composition of the effluent.

There is a good deal of the product of the tank carried out by the tank effluent, as can be seen in a good light in a test tube, but so finely divided as to be difficult to see with the eye, but on careful looking it can be seen to be diffused throughout the entire liquid; the larger particles seen under the same conditions are portions of the growth in the pipes and channels. Were it possible to keep this tank product back, or from passing to the filter surface, the attention required to be given to the latter, although small now, would be much reduced.

The automatic arrangement for distributing the effluent to the filters is one of the greatest helps to the efficient and economical working of the system. It early became evident that a mechanism of this sort would be necessary, the curve of the hourly flow of the sewage being the first to show it, but it was not till in conversation with the President of this Congress, Lord Iddesleigh, at Pynes, that it took definite shape in my mind. These mechanisms, the simpler they are, the more reliable, and it must be evident that reliability is of first importance; it is better to sacrifice some of the ideas one would like to see carried out than introduce too many complications.

With the purely domestic sewage from St. Leonard's, the best period for the effluent to be in the filters was found to be one hour. This would give a longer time to the filters to drain and aerate. But although this period is much exceeded, especially at night, the filters do good work.

## INSTITUTE OF SANITARY ENGINEERS.

ON Wednesday evening at the Rooms of the Institute, 19, Bloomsbury-square, Mr. F. G. Rayner (Chairman of the Council), delivered his opening sessional address. Mr. H. M. Dove presided, and apologised for the smallness of the attendance owing to the bad weather, and the fact that many members were still away holiday-making.

Mr. F. G. Rayner, in the course of his address, said the subject he had chosen was that of infectious hospitals, exclusive of small-pox hospitals, for small districts. Much had been said with regard to large hospitals with pavilions and floors to accommodate patients from large populous districts, but little had been said which would help Local Authorities to provide for districts with a population of up to about 8,000 persons. Mr. Rayner first dealt at some length with the various Acts governing the subject of the provision of hospitals, and, proceeding, said that no doubt owing to local feeling and prejudice it often happened that the best site for the purpose of erecting an isolation hospital was not obtainable, with the result that secondary sites were sometimes chosen. The considerations which should govern the selection of a site should be a good elevation or a gentle slope, and there should be nothing to interfere with the free circulation of air round the buildings. Attention should also be paid to the questions of water supply, the easy means of access for doctors and patients, and the possible need of extension or of temporary arrangements being made during an epidemic. For a small district a site of two acres might be sufficient, but he thought three acres were preferable as it gave more scope for the buildings. The size of the hospital depended upon the population of the district and its probable rate of increase, but in any case accommodation should be provided at the rate of one bed per thousand inhabitants, and then for the more perfect working of the hospital separate wards should be provided for different diseases, to be safely dealt with and properly treated simultaneously. It was not wise to construct permanent buildings of corrugated iron, although as a temporary measure they were very useful. There should be only one means of access to the hospital, controlled and overlooked by the porter's lodge. In the construction of the building, it should be divided into three parts, viz., (1) the administrative block for the staff and stores; (2) different wards for infected persons; (3) mortuary, laundry, disinfecting rooms, &c. The administrative block should be placed near the entrance to the grounds, unless a separate porter's lodge is provided instead, which should contain sufficient accommodation for nurses and staff, kitchen, store, dispensary room for the medical officer, together with all necessary appliances. This block should of necessity be detached entirely from the ward buildings and made to communicate only by a covered passage with both sides open, so that a cross current of air might pass between the buildings. Several essential points were to be borne in mind when planning an isolation hospital, viz., complete isolation of the infected buildings and thorough ventilation of all parts, allowing for cross currents of fresh air; the avoidance of dark corners; the obtaining of the largest amount of light possible; drainage, disinfection, &c. The ward buildings should be at least 40 ft. away from the administration block, which distance was required by the Local Government Board, but he recommended 50 ft. or 60 ft. at least. The walls should be composed of good sound, hard, well-burned bricks, stone, or concrete, and so arranged that each bed might have at least 12 ft. lineal wall space, 144 square ft. of floor space, and 2,000 cubic feet of air space. Provision must be made for annexes to contain closets and sinks separated from the main building by cross ventilated passages. There should be only two entrances to the ward—one for admitting patients, the staff, &c., and the other for removing the dead. If necessary, the land should be first underdrained, and the site covered with at least 6 in. of good Portland cement concrete to obviate any damp arising from the soil. A good cement concrete foundation should be placed under the walls, and for one-floor buildings the walls would be best if hollow and of not less thickness than 16 in. The damp course must be efficient, and he strongly recommended two courses of stout slates well looped by joints bedded and pointed in cement. The course of brickwork above and below, if built in cement, mortar, and slates, should go through the whole thickness of the walls. Sufficient air bricks should be provided at the top and bottom of the cavity to allow of free circulation of air. For the warmth and dryness of the building, the roofs should be covered with board and felt, and best Bangor or other slates fastened to the boarding with copper nails. In the construction of the ground floor of the wards it was best to keep them well above the surrounding ground line, and the less joints seen the better. The floor should be hard and impervious to germs, and he recommended teak laid in long narrow widths, set in bitumen on a good concrete foundation. The height of the wards should be not less than 12 ft. and not over 13 ft. in the clear. The covering of the walls and ceilings was very important, and these should be plastered in Keen's or Roman cement, with all angles and corners rounded off to prevent the accumulation of dust. He deprecated the use of glazed tiles owing to the numerous joins collecting germs. Flat roofs he considered more adaptable than pitched roofs. There should be provided in the walls and under each bed one fresh air inlet with a sliding door to regulate the supply of air. The windows should be double, having sliding sashes, and should allow of the lower sash being raised and a current of air admitted without causing a draught. The question of the size of the window surface per cubic space should be worked out to a proportion of 1 square foot to about every 70 cubic feet. The sanitary arrangements needed careful attention, and so many classes of baths, sinks, closets, and slop sinks are in the market that he did not care to advance one pattern before another. It should be seen that in slop sinks they had washers, plugs, and overflows, and make the discharge externally over glazed channels to the gullies. They should also be well trapped and fitted with brass screw caps

so that they may be easily cleaned. Having dealt with the questions of baths and closets, Mr. Rayner said that heating and ventilation were important items. Where steam was obtainable it was better to use it, and to use radiators, as they could be placed to better advantage. He preferred heating by low pressure, and the radiators placed beneath the windows. A covered verandah added to the wards was very useful, and these should be 10 to 12 ft. in width, and well protected from the weather. As to the lighting, that depended on the locality, but where possible electricity was the best. With regard to drainage, the drains should be laid in straight lines, and in one fall from point to point, with a gradient of not less than 1 in 30.

They should be laid on a bed of 4 in. of Portland cement concrete, and after being tested should be bedded in concrete, so that there might be no possible contamination of the surrounding soil. Where the drainage could not be connected with the main sewer, he would recommend the use of earth closets, but these, of course, did not do away with cesspools. If the soil was suitable, and there was no risk of contaminating a well, the cesspool might be constructed of open brickwork; but where there was a chance of contamination there must be 9 in. brickwork in cement mortar, clay puddled between the brickwork and soil, and a bottom of concrete. The outbuildings, consisting of the laundry, mortuary, disinfecting chamber, ambulance shed, coal house, &c., should be built some distance from the ward buildings.

A short discussion followed, and Mr. Rayner was heartily thanked for his address.

## BOOKS RECEIVED.

BUILDING CONSTRUCTION AND DRAWING. By Charles F. Mitchell, assisted by G. A. Mitchell. Sixth edition. (London: B. T Batsford.)

SHORING AND UNDERPINNING. By C. Haden Stock. Third edition, revised by F. R. Farrow. (London: B. T. Batsford.)

PAPERS OF THE BRITISH SCHOOL AT ROME. Vol. I. (London: Macmillan & Co., Ltd.)

# Correspondence.

### THE ENTASIS OF AN OBELISK.

SIR,—Can any of your readers give me information as to the correct entasis, if any, to put on an obelisk?

The one in question is 15 ft. high, and is 2 ft. 10 in. square at the base and 1 ft. 8 in. square at the top.

X. Y. Z.

### BORINGS.

SIR,—In my position as contractor's foreman I have just received instructions to put an old iron tank together to hold water.

It is composed of a number of cast-plates, which are to be bolted together and the joints made with iron borings and sal ammoniac. Can you tell me how to prepare, and the quantities of borings and sal ammoniac which are usually used for this purpose?

A. WINTON.

**** The best proportions for rust-joint cement are as follows: Iron borings, 12 lbs.; powdered sal ammoniac, 2 ozs.; flour of sulphur, 1 oz. These ingredients should be mixed with water to form a paste, and, as the result is a slow-setting cement, the joints must be allowed to harden before any use is made of the tank. The approximate weight of dry borings is equal to one-fifth of the cubic contents of the joint in inches.—ED.

# The Student's Column.

## THE CHEMISTRY OF BUILDING MATERIALS.

### II.—BRICKS AND CLAY WARE.

MANUFACTURE OF BRICKS.—Clay to be used for making bricks is first exposed in layers or small heaps to the weather for several weeks or months, either alone or mixed with breeze and chalk. All stones are then picked out, and the clay is ground to a coarse powder. If the grinding process be omitted the clay has to be weathered for a longer period than is otherwise sufficient. The clay is next *tempered* by being passed through a pug mill, in which the clay is thoroughly kneaded with water. The clay passes out of the pug mill in a condition suitable for moulding. The rectangular moulds are rather larger than the finished bricks, for the clay usually shrinks to an extent equal to about one-tenth of its original dimensions.

The mould is completely filled by the operator with tempered clay, and the surface is levelled with a straight-edge, which when drawn across the top of the mould pushes off all superfluous clay. When the moulding is performed by machinery the clay is cut by wires into blocks of the required dimensions as it passes out of the pug-mill, or the clay is automatically forced into moulds. Hand-made bricks are made with a "frog" (a depression or hollow) on one side, the object of the frog being to form a key for the mortar. Wire-cut bricks have no frog, and the marks of the wire are visible on the surface of the brick.

The moulded bricks are dried by exposure to the air or by artificial heat, and are then burned either in kilns or in clamps. A clamp is a stack of unburned bricks arranged in pyramid form, with a flue. Breeze is mixed with the clay used for making the bricks, or is placed in the spaces between the bricks in the stack, to assist in the baking of the clay. Fires are lighted in the flues of the clamps, and are kept burning for several weeks.

Bricks may conveniently be divided into the following three classes:—1. Building bricks. 2. Paving bricks. 3. Firebricks.

*Building bricks* are usually subdivided into:—(1) ordinary building bricks, (2) underburnt and misshapen bricks, and (3) cutters or rubbers. Ordinary bricks are hard bricks of good shape and comparatively uniform colour and texture made as already described.

Underburnt and misshapen bricks, commonly known as "grizzle" or "place bricks," are defective stock sometimes used for the interior portions of walls. The use of underburnt bricks should not be permitted in any work of importance.

Cutters or rubbers are made of carefully washed clay, free from lumps, and of comparatively uniform composition. These bricks, after burning, are sufficiently soft to enable them to be readily cut or rubbed into any desired form. Inferior rubbers when exposed to the weather wear away rapidly.

*Paving bricks* are manufactured with clays containing a considerable proportion of iron oxide, and are fired at a higher temperature than is used for ordinary building bricks. Under the influence of the high temperature the clay becomes vitrified to a much greater extent than is usual in ordinary bricks, and becomes almost black in colour owing to the formation of silicate of iron. The bricks are stronger, harder, and much less porous than ordinary bricks.

*Firebricks* are most commonly made with fireclay, the composition of which was discussed in the preceding chapter, but other materials are sometimes used in lieu of fireclay. *Ganister* is an argillaceous sandstone found under some of the coal beds in the North of England and elsewhere which is largely used for lining furnaces and for making bricks. It contains from 80 to 90 per cent. of silica, and will withstand high temperatures without shrinking. *Dinas bricks* are made by grinding the Dinas rock and sand found in the Vale of Neath in Wales, adding about 1 per cent. of lime, and kneading, moulding, and firing the mixture in the usual manner.

Other earths less extensively used for firebricks are *chrome iron ore*, *magnesian limestone*, and *bauxite*. Bauxite consists mainly of hydrated oxides of alumina and iron, but usually contains a certain proportion of silica. When magnesian limestone is used for brickmaking, it is first heated to expel the carbon dioxide, then mixed with tar and moulded under pressure, and then fired at a high temperature.

*Acid firebricks* are those which contain an excessive proportion of silica. Such bricks are attacked by lime and other basic substances at high temperatures. *Basic firebricks* are those which contain an excessive proportion of lime or other basic substance. Such bricks are attacked at high temperatures by silica or other substances of a like nature capable of entering into chemical union with the lime or other base.

*Glazed Bricks* consist of fireclay weathered, ground, tempered, moulded, pressed, and dried in the usual manner. The dry bricks, either before or after burning, are dipped into a bath containing "body dip," and after being allowed to air-dry for a short period are dipped into a bath containing "glaze dip." The period between the dipping into body dip and dipping into glaze dip varies from a few minutes to two hours, according to the condition of the clay, and is shorter for burnt bricks than for unburnt bricks.

Every firm of glazed brick manufacturers has its own particular formulæ for body dips and glaze dips. A large number of such formulæ are given in Ansell's book on the manufacture of glazed bricks and sanitary ware, but it would serve no useful purpose to discuss in detail such formulæ in these columns, for they are all empirical rather than scientific.

The following may be regarded as typical formulæ for body dip and glaze dip respectively, but the formula must in each case be varied to suit the character of the clay of which the brick is composed, and practical experience in the manufacture of glazed ware is at present of more importance than a knowledge of the chemical composition of the materials used for producing the enamel and glaze:—

| | Mixture for White Body. | | Mixture for White Glaze. |
|---|---|---|---|
| White ball clay | 10 | Felspar | 40 |
| Flint | 16 | Stone | 40 |
| China clay | 54 | Flint | 6 |
| Stone | 20 | Whiting | 8 |
| | | Plaster of Paris | 6 |
| | 100 | | 100 |

The only ingredient in the foregoing formulæ which requires description is "stone." This material is also known as "Cornish stone" and "China stone," and is a decomposition product of the rock known as pegmatite. It consists mainly of felspar and quartz.

For the manufacture of glazed bricks or other ware, the Cornish stone is crushed in grinding mills to a fine powder. When subjected to a high temperature it fuses and forms a white glazed mass, but it requires admixture with a flux to cause it to flow sufficiently freely.

China clay is nearly always the main constituent of the body dip, but it is usually mixed with China stone, flint, and clay. The glaze dip often contains oxide of zinc or sulphate of barium. Suitable compounds of the metals iron, copper, maganese, chromium, &c., can be added to the dip when coloured glazes are required. After the bricks have been treated with body dip and glaze dip, they have, of course, to be baked in an oven irrespective of any firing to which the bricks may have been subjected before dipping.

*Salted Bricks* are bricks covered with a transparent glaze, produced by placing salt in the kilns while the bricks are being burnt. The salt solutilises and acts as a flux upon the clay, and a fused insoluble silicate is formed on the surfaces of the bricks.

*Unglazed Earthenware* is often made with the same clays as those used for ordinary building bricks. Such earthenware is of inferior quality, and is very porous. Earthenware is baked in kilns.

*Glazed Earthenware* is often produced by forming a *lead glaze* on the surface of common earthenware. The unglazed goods are dipped into a bath containing oxide of lead and suitable fluxes mixed into a paste with water. When the articles are withdrawn and reburnt, the lead oxide and other compounds fuse and completely cover the articles with an impervious glaze.

*Fireclay Ware* is earthenware made of fireclay instead of ordinary brick clay. It is used as a substitute for stoneware, but for most of the goods used by builders it is inferior to stoneware.

*Stoneware* is made with clay from the Lias formations mixed with sand and ground pottery to prevent shrinkage. It differs from unglazed earthenware in being impervious to water even when not glazed, and is stronger and more durable. Most stoneware articles are, nevertheless, glazed by placing salt in the kilns in which the stoneware articles are burnt.

*Terra-cotta* is refractory clay containing sufficient oxide of iron to give it a characteristic reddish colour. To prevent undue shrinkage, ground pottery, ground glass, sand, or burnt clay is added in large proportion. The mixture is carefully ground, kneaded with water, moulded, dried, baked in a pottery kiln, and then slowly cooled. The temperature employed for baking terra-cotta is much lower than that used for stoneware. The red clay for making terra-cotta articles has to be very carefully selected. If it contain more than 7 or 8 per cent. of iron oxide the clay will be too fusible. In some cases the clay used is an artificial mixture of china clay and oxide of

iron, and some of the natural fireclays make fairly good terra-cotta.

*Tiles.—Roofing* and *paving tiles* are made of moderately pure brick clays in the same manner as bricks, and are baked in kilns. The colour of red tiles is due to the presence of oxide of iron. *Encaustic* or *decorative tiles* of the best description are made in three parts:—(1) the face, which is a slab of good quality clay of suitable colour for the ground of the pattern; (2) the body, which is a coarser clay; and (3) the back, which is a thin slab of suitable clay.

Indentations or moulds of the form required are made in the face slab by means of a plaster cast, and coloured "slip" (*i.e.*, coloured clay made plastic with water) is placed in the indentations. When dry, the tiles are baked in ovens, and in some cases are glazed by being dipped into a mixture of water and powdered glass and then reheated.

Cheap encaustic tiles are made by painting or printing a pattern on the surfaces of white clay tiles and then coating the printed surfaces with a transparent glaze.

*Majolica tiles* are clay tiles covered with an opaque coloured glaze.

*Water Absorbed by Bricks*.—Bricks which have not been sufficiently burnt are deficient in strength and durability, and are capable of absorbing a larger proportion of water than properly burnt bricks. Bricks capable of absorbing more than 20 per cent. of their weight of water should be rejected, the normal absorption capacity of bricks of good quality varying from 4 to 18 per cent.

## GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, EASTON, BRISTOL.—The opening services at New Castle Green Congregational Church, Greenbank-road, Easton, took place on the 4th inst. The building has been erected by the Bristol Congregational Church Extension Committee, acting in conjunction with the members of a small Congregational church in Hinton-road, near at hand, and with the trustees of the old Castle Green Chapel. The church has been built by Messrs. George Humphreys & Sons from the designs of Mr. Frank Wills, and the total cost has been about 5,000*l*. The building is of brick, and, including galleries, it will provide seating accommodation for about 800 persons. The organ, which belonged to the old Castle Green Chapel, has been renovated by Mr. W. G. Vowles, and placed in the new church.

MALMESBURY ABBEY. — It is reported in the Bristol Diocesan Magazine that good progress has been made with the restoration of Malmesbury Abbey Church. The work was commenced in 1899, and was entrusted to Mr. Harold Brakspear, F.S.A., the contractors being Messrs. Hayward & Wooster, of Bath. What has been accomplished comprises the rebuilding of some of the flying buttresses over the aisles which threatened to fall, the reinstating the destroyed upper parts of their counterbalancing pinnacles, the parapets of the north side, and the renewal of the perished stonework generally, the releading of all the windows, and the renewal of all the gutters and downpipes, relaying the aisle roofs, and making all the roofs watertight. The necessary drainage has also been done, and a concrete surface gutter put round the walls. In addition to these works the missing pillar at the west end of the nave on the south side has been replaced, together with the main arches, triforium, and clear-story above, as being the best means of giving the necessary support to the south-west corner of the present church, the state of which threatened ruin to the noble south porch. A further contract entailing an expenditure of about 1,300*l*. has been entered into for the purpose of covering the work that remains to be done at the west end, and comprises the completion of the vaulting of the two ruined bays of the aisle, the continuation of the roof over up to the original west end, walling in temporarily the two main arches that have been rebuilt, and throwing into the church the two bays, the restoration of which will have been thus effected, making good the top of the west wall and turret, and repairing the remaining portion of the old west end, also completing the open parapets of the aisle and clearstory. In planning the new work, the main lines of the ancient design have been followed; but care has been taken to show that it is modern, and to prevent misconception as to its date in the future.

EAST FINCHLEY BAPTIST CHURCH AND SCHOOLS.—A new Baptist church is to be erected at East Finchley. It is designed with nave, aisles, transepts, and choir, with three vestries, the seating all radiating on a circular plan from the pulpit. Accommodation is given for 764 adults on ground floor (including seventy-two in end gallery), or a mixed congregation of about 870 persons. A tower is placed at the corner of the church, which will stand at the corner of two roads, the Great North-road and Creighton-avenue. The schools, which have now been opened, are of two stories, consisting of a hall with eight classrooms at the sides, partitioned off from each other by sliding panelled partitions, so arranged that the whole school can be thrown open into one large hall for use as a chapel until the new chapel is erected, and one at the end opposite the platform; two front entrances and two staircases up to the galleries on three sides to be used for classes; two large senior's classrooms in the rear, and a large infants' room, &c., and kitchen. The buildings are faced in front with split flints with stone dressings. The architects are Messrs. George Baines and R. Palmer Baines, Clement's Inn, Strand, London, W.C.

CHURCH, CLADDAGHDUFF, CLIFDEN, IRELAND.—The Star of the Sea new Church, recently erected at Claddaghduff, Clifden, was dedicated on the 7th inst. by the Archbishop of Tuam. Within a few hundred yards of Omey Island the new church is situate. It is Gothic in style and cruciform on plan. In length it measures 116 ft., the transepts 66 ft., the width of the nave 26 ft., the height to the ridge 43 ft., and to the highest point of the belfry 53 ft. There are three stained-glass windows over the high altar, while the building throughout is pierced with a number of leaden lights. Messrs. Ryan & Sons, Dublin, supplied the stained-glass windows, and Messrs. Brooks, Thomas, Dublin, the altar rails and gallery; and Messrs. Moonan & Sons, Dublin, the stations of the Cross. Mr. Hamilton, of Galway, was the architect; and the builder was Mr. G. R. Emerson, of Clifden.

SCHOOL, HANLEY, STAFFORDSHIRE.—The New Grove School at Hanley has just been opened. The new school has cost a sum approximating 10,000*l*., including apparatus, and will afford accommodation for 670 boys and girls, which, with the older portion, brings up the total accommodation to 1,000 children. The contractors for the general building were Messrs. Tompkinson & Bettelley, of Long-ton. The whole of the work has been carried out from the designs and under the superintendance of the Architect to the Board, Mr. E. E. Scrivener, of the firm of Messrs. R. Scrivener & Sons, architects, Hanley.

SCHOOLS, STOCKPORT.—The new schools erected at Spring-gardens, Stockport, which will accommodate 600 boys and girls in the mixed school and 220 infants in a separate infants' school, were opened on the 5th inst. Messrs. Stott & Sons, of Manchester, are the architects of the new schools, and the builder is Mr. Josiah Briggs, Stockport. The principal room gives seating accommodation for about 1,000 persons. The building is faced with red brick, with buff terra-cotta dressings and half-timbered gables.

BOARD SCHOOL, VICKERSTOWN, BARROW-IN-FURNESS.—The new Vickerstown Board School, which has been erected upon Walney Island for the children of the new town being built by Messrs. Vickers, Sons, & Maxim, was opened on the 30th ult. The total accommodation is for 648 children, and the buildings are of one story, containing a central hall 65 ft. 6 in. by 33 ft., and ten classrooms, with cloakrooms and two teachers' rooms on the ground floor, and large heating chamber and store-room in the basement. The walls are built of bricks faced externally with Askam bricks to a height of 4 ft., and above that with rough cast in cement, coloured a cream colour, and with St. Bees stone dressings. The roofs are covered with grey Walna Scar slates and red ridge tiles. Internally a dado 4 ft. high of coloured glazed bricks runs round all the rooms and corridors, and the walls above this are plastered and coloured. The buildings are lighted throughout by electricity. The total cost of the work, including playgrounds, play-sheds, and boundary walls, is 8,075*l*. The contractors for the work are: Excavator, bricklayer, and joiner, Messrs. Clark & Robinson; mason, Messrs. G. Varley & Son; slater and plasterer, Mr. James Walker; plumber, painter, and glazier, Mr. James Gell; ironfounder, Mr. W. Barrett. Mr. Henry T. Fowler, of Barrow-in-Furness, is the architect.

ASYLUM SCHEME, BANGOUR, EDINBURGH.—The report by Mr. George T. Hine, architect, London, on the new Bangour Asylum scheme of the Edinburgh Lunacy Board, has recently been issued to members. The remit to Mr. Hine, of date May 14 last, was to the following effect:—"That the report of the Special Committee, as far as regards recommendations Nos. 3, 4, 5, 6, and 7, be remitted, along with the architect's plans, specifications, and measurements, to Mr. Hine, architect, London, for his consideration (in consultation with Mr. Blanc if necessary), and with special instructions to report to the Board as soon as possible (1) whether the plans can be modified or remodelled so as to reduce the total cost to a sum representing 300*l*. per bed or less; (2) whether the plans can be adapted to brick harled; (3) whether by building with brick harled the cost would be reduced to any, and if so to what, extent, and generally to advise the Board in the matter." The following is the summary of Mr. Hine's report:—First—"Whether the plans can be modified or remodelled so as to reduce the total cost to a sum representing 300*l*. per bed or less?" My answer to this is "Yes, subject to my correctly interpreting your meaning of price per bed." Secondly—"Whether the plans can be adapted to brick harled?" To this I again reply in the affirmative. Thirdly—"Whether by building with brick harled the cost will be reduced to any, and if so to what, extent?" I say in answer to this that by adopting the simplest form of brick harled treatment the cost may be reduced to something less than 300*l*. a bed. Fourthly—"To advise the Board generally in the matter." My advise is (*a*) to adhere to stone construction, but in a less expensive form, and to modify the interior treatment of the different buildings, cutting down the cost in all legitimate ways. By doing this a more suitable form of construction than brick harled will be obtained at comparatively little extra cost, and much time and expense in other ways will be saved; (*b*) to commence building operations at once by erecting the infirmary and administrative block. This will test the cost and suitability of the form of construction recommended, and relieve, to some extent, the urgent pressure for accommodation.

INDUSTRIAL SCHOOL, GLASGOW.—Lord Provost Chisholm opened on the 30th ult. a new day industrial school provided by the Juvenile Delinquency Board for the Western District of Glasgow. The premises, situated in William-street, and formerly known as St. Matthew's Public School, have been altered and adapted for the purpose of a day industrial school, the work being carried out under the supervision of Mr. J. M. Munro, architect.

SCHOOL, BEVERLEY.—Lord Wenlock, Chairman of the East Riding County Council, opened the newly-erected Beverley Grammar School on the 2nd inst. The new buildings have been erected on the west side of Queensgate, on a site which stretches westward towards Westwood. The principal entrance leads to a central corridor, on either side of which are the classrooms, three in number, each 21 ft. 6 in. by 20 ft., and each accommodating twenty-four boys in single desks. Two of the classrooms are divided by a movable partition, so that they can be converted into a single room. On the right of the entrance is the head master's room, and on the other side of the corridor is a cloak room and lavatory fitted with glazed stoneware basins. By the side of the cloak-room is an entrance from the playground. At the north end of the building are the rooms to be devoted to science-teaching—a laboratory, 30 ft. by 22 ft., fitted with chemical working benches, and a lecture-room, 22 ft. by 20 ft. 6 in., with desks on a stepped gallery. The south end of the building is planned so that a central hall and further classrooms can be added when extensions are required. All the classrooms, &c., are lighted from the left side, and are warmed by ventilating firegrates, which supply warmed fresh air to the rooms; the extract ventilation being by flues carried up with the chimneys. The exterior is simply treated in red brick, with stone dressings, and the roofs are covered with red tiles. The latrines are in a detached building on the west side of the site. The new buildings have been erected, under the superintendence of Mr. John Bilson, F.S.A., architect, of Hull, by Mr. J. Constable, builder, of Beverley.

POST OFFICE, SUNDERLAND. — A new post office is being erected at Sunderland. The site consists of over 1,800 square yds., and the main block of the new premises is at the south end, facing that portion of the shubbery which has been laid out as gardens. At this point, and about 65 ft. back towards High-street, the building is four stories high. On the first floor of the main building there are offices for the postmaster, telegraph engineer, &c. A well runs up the centre of the main front block for light and ventilation, faced with glazed bricks. On the second floor of this block are the instrument room, 60 ft. by 25 ft., and a telephone room, 36 ft. by 21 ft. The ground floor embraces the large public hall, 60 ft. by 25 ft. There are two entrances to the public hall, one from Norfolk-street and the other from West Sunniside. The outside letter-boxes are in West Sunniside, but there are also letter-boxes in the public hall, so that people from the Norfolk-street side of the town will be saved the trouble of coming round. On the ground floor there is also a telegraph boys' delivery-room and a registered letter office. Further back is the sorting-room, which occupies the width of the site, and measures 90 ft. by 52 ft. Behind this will be the loading platform for the mails, and then comes the yard between the Post Office and the Inland Revenue Office. The basement will contain accommodation for postmen, clerks, telegraph linesmen, and stores. That portion of the building embracing the sorting-room, &c., stretches towards High-street for 110 ft., and is one story in height, 33 ft. above the pavement, but it can be heightened should extensions be needed in the future. The base of the building is of freestone, from the Cocklaw quarries, Chollerford, and the upper part will be of stone from the quarries at Denwick, near Alnwick. The Inland Revenue Office is at the opposite end to the main postal block, and will be of three stories. It contains offices for the Surveyor of Taxes, Supervisor, and clerks. All the floors are of concrete, covered with wood-blocks, excepting the public hall, which will be paved with stone. The building will be provided with lifts, and lighted throughout by electricity. The architect is Mr. Henry Tanner, of H.M. Office of Works, and the contractor is Mr. J. W. White, of Sunderland. Mr. Ernest J. Searchfield, of H.M. Office of Works, has acted as clerk of works.

BUSINESS PREMISES, BRISTOL.—Messrs. Smith, Neville, & Co. have just opened a bakery, bread

store, loading-up shed, stabling for fourteen horses, suite of offices, and various outbuildings. The buildings have been designed by Messrs. Paul & James, architects, of Bristol. The contractors are Messrs. W. & J. Bennett.

## *FOREIGN.*

FRANCE.—The jury in the competition for a group of school buildings at Montreuil have awarded the first premium to MM. Duménil and Brandon, of Paris.——During the work of repair at the cathedral of Châlons-sur-Marne (the towers of which were in a dangerous condition), some fine sculptures of the twelfth century have been discovered, especially a font with carved bas-reliefs, which must have come from the original Romanesque cathedral built in 1149.——The municipality of Bourges intend to demolish the fifteenth-century church of St. Bonnet, which is in a ruinous condition.——The municipality of Vichy have voted a sum of 840,000 francs for the embellishment of the town.——Works are shortly to be commenced for the improvement and deepening of the port of Algiers, at an estimated cost of 1,500,000 francs.——M. Marqueste, the sculptor, has been commissioned by the Government to execute a bust of the late eminent landscape-painter Dupré.—— Excavations are in progress among the ruins of the celebrated château of Montfort l'Amaury (Seine-et-Oise), which have led to some interesting discoveries. The works have been undertaken by the municipal authorities at Montfort. The crypt of the ancient chapel has been brought to light, as well as some fine early Gothic sculptures.—— MM. Hubert Marie and Letort, architects, have nearly completed the restoration of the sanctuary of Notre Dame des Arts, at Pont de l'Arche, commenced five years ago.——The Municipal Council of Vannes has decided on the building of a theatre, a museum, a public library, and a market, at an estimated cost of about a million francs.——A scheme is under consideration for a canal to unite the canal of the Loire with that of Bourgogne.——The scheme for the prolongation of the Rue de Rennes at Paris, together with the construction of a new bridge over the Seine, has been adjourned *sine die*, partly on account of the estimated cost, which would amount to fifteen million francs, partly on account of the opposition of the Institut de France, part of the building of which would have to be demolished in prolonging the Rue de Rennes.——M. Ernest Letrosne, architect, has died at the age of seventy-five. He was a member of the Société Centrale des Architectes. He had been a pupil of Léon Vaudoyer, and till 1860 was Inspecteur des Travaux at the Louvre, and was also Professor at the Ecole des Arts Décoratifs. He was well known as the architect of many important buildings.

INDIA.—The Simla Fine Arts Exhibition appears to be a great success, and is said to contain many water colours of exceptional merit. The number of exhibits exceeds last year's total by 103.——The recent cyclone has had the effect of considerably modifying the soundings of the approaches to Karachi Harbour, and dredging will doubtless have to be resorted to on a large scale.——The Pamban branch of the South Indian Railway has been completed and was recently opened for traffic. The line runs from Madura to Mandapam.——The hill station of Mussoorie is to have its water-supply considerably augmented; the engineer proposes to utilise the Kempti Falls to generate power to drive pumps at some springs not far from the station.——The Corporation of Calcutta contemplate widening Municipal Office-street, owing to the congested traffic.

UNITED STATES.—Building contractors in Chicago are suffering from scarcity of labour, and have to pay about 10*s.* a day for the services of hod carriers and the like.——The Municipal Art Society, of New York, has under consideration a scheme for improving the City Hall Park, and consolidating the municipal departments. The present buildings in the park are said to be all more or less shabby and inconvenient except the City Hall itself, which, however, is very much overcrowded.

## *MISCELLANEOUS.*

CITY SUBWAYS REGULATIONS.—With a view to obviating the constant disturbance of the street traffic, the City Corporation has drawn up a number of by-laws which will shortly come into force. In future a company wishing to bring a pipe or wire (other than a service pipe or wire) into a subway, must give, in writing, fourteen days' notice to the Corporation, together with information as to the insulation and the highest electric motive force for which they may be used. Three days before any company can put a service pipe or wire into a subway, notice must be given to the City Engineer. Fourteen days' notice must be given by any company of its intention to remove any pipe or wire. In the case of repairs, three days' notice will be necessary. No work involving the alteration or reconstruction of any part of a subway will be permitted until the expiration of forty-eight hours after notice has been given to the owner of any pipe or wire in the subway. All companies owning pipes or wires must, within six months of the confirmation of the by-laws, deposit with the Corporation full particulars of their pipes and wires, and in the event of any company failing to carry out the by-laws or of supplying incorrect information, it will be liable to a fine of 5*l.*, and to a further penalty of 40*s.* for each day during which the offence is continued.

CAPITALIST COMBINATIONS. — At the Trades Union Congress last week, Mr. Ben Cooper moved "That, in the opinion of this Congress, the growth of gigantic capitalistic trusts, with their enormous power of controlling production, is injurious to the advancement of the working classes, as by such combination the price of commodities is raised, the standard of comfort of the people can be reduced, the workman's freedom endangered, and national prosperity menaced." He accepted an amendment from the Gas Workers' Union advocating national ownership of those monopolies. He held that the trusts and combines threatened their rights as workmen and could, if they wished, starve the people into submission. Mr. Clyne seconded the resolution, which was carried unanimously.

PICKETING.—At the Trades Union Congress last week Mr. R. Bell, M.P., moved:—"That the Congress again emphatically protests against the series of legal decisions in the House of Lords and in the Courts which have thwarted the express intentions of the Trade Union Act, 1871, the Conspiracy and Property Defence Act, 1875, and which have distorted the common law of the land in such a way as to deprive workmen of the full right of combination and to seriously jeopardise the funds of the Union collected with so much sacrifice of the toilers of this country, and hereby demands fresh legislation, which shall—1. Clearly confer upon the Unions the rights of voluntary association enjoyed by them under the Trade Union Act, 1871, and of which they were deprived by the Taff Vale decision in the House of Lords. 2. Legalise peaceful picketing and persuading. 3. Make it perfectly legal for men to withdraw their labour other than in breach of contract, and also for Unions to sanction such withdrawal, and for officials to advise or convey the decision to withdraw under all circumstances where men are pursuing the objects of Trade Unionism. 4. To clearly define the law of conspiracy so that what is legal for one man to do shall not be either a criminal offence or an actionable wrong if done by many in combination. 5. To generally define and codify the laws of Trade Unions and industrial disputes in accordance with the principles above expressed, and hereby instructs the Parliamentary Committee to immediately take the necessary steps to give effect to this resolution. And further pledges itself to do all possible to secure legislation on these lines by bringing pressure to bear through all the unions upon Members of Parliament and Parliamentary candidates, both in the Lobby and at the polls." He said that all they wished was to be put on an equality with the employers of the country. Every one had believed that Trade Unions were free from the interpretation put upon the law by the House of Lords. If he was not mistaken, they would be put upon such an equality. If a man was attacked by a striker, he could be punished by the magistrate, but it was absurd to hold the whole union responsible for the act of the individual.—Mr. Brace seconded the resolution, which was carried unanimously.

WAGES.—At the Trades Union Congress last week it was resolved to adopt the following series of resolutions:—"That the Parliamentary Committee be instructed to approach the Admiralty with a view of getting them to agree to pay to the various trades and grades employed in the building of Government vessels in his Majesty's Dockyards not less than the rate of wages as is mutually agreed upon between employers and employés doing similar work in the several shipbuilding centres in the country; failing to obtain their consent, to then endeavour to get this question raised when the Admiralty Vote is discussed in the House of Commons. That this Congress request the Parliamentary Committee to endeavour to raise a discussion in the House of Commons in the early part of the forthcoming Session, 1903, on the question of labourers' wages in all Government factories and dockyards, such discussion having for its object the raising of wages for labourers to a minimum of 30*s.* per week, and the payment of trade union rates of wages to all trades in such factories and dockyards. That this Congress is of opinion that, in order to assist the better working of the Fair Wages resolution of February, 1891, it is necessary that a list of all Government contracts given out by the separate Departments should be published monthly in the *Labour Gazette*, with the names and addresses of all contractors; and that a firm shall be taken to be an unfair firm that employs any workmen below the recognised standard, and instructs the Parliamentary Committee to at once take steps to bring this matter before the various Departments of the Government, and also obtain from Parliament a clearer definition or amendment to the Fair Wages Clause resolution respecting prices as well as wages, and what is a district for the purposes of the Clause."

CROMER ELECTRIC LIGHTING.—A Local Government Board inquiry was held by Major C. E. Norton, R.E., at the Town Hall, Cromer, on the 5th inst., into the application of the Cromer Urban District Council for sanction to borrow 25,000*l.* for purposes of electric lighting, and 2,500*l.* for the provision of a store yard on the north side of the Beach (Midland and Great Northern Joint Railway) Station in the town. There were present Mr. J. K. Frost (Clerk) and Mr. A. F. Scott (Surveyor), Mr. Edward H. Cozens-Hardy (Messrs. O'Gorman & Cozens-Hardy, consulting engineers), and others.

EDINBURGH MASTER BUILDERS.—The second annual excursion of the Master Builders' Association and Building Trades Exchange of Edinburgh took place on the 4th inst. to Alloa. A company numbering about eighty travelled from the Waverley Station to Alloa, thence in brakes to Rumbling Bridge. Rain fell heavily during the greater part of the day, but the weather cleared up in the afternoon, and the drive back to Alloa was made under pleasanter conditions.

NATIONAL ASSOCIATION OF MASTER HOUSE PAINTERS AND DECORATORS.—A convention of the National Association of Master House Painters and Decorators of England and Wales is to be held in the Grand Assembly Rooms, Newcastle-on-Tyne, on the 23rd, 24th, 25th, and 26th insts. Mr. J. D. Crace, President of the Institute of British Decorators, will open an exhibition. The President of the convention is Mr. J. Graham Cole. Various papers are to be read, and one day is to be devoted to excursions and visits. The annual dinner will be held at the County Hotel, Neville-street, on the 25th inst.

OPEN SPACES.—By the purchase of Brandlehow Park, on the western shore of Lake Derwentwater, a tract of beautiful pasture ground and woodland, which had been threatened with spoliation for building purposes, is permanently preserved for public enjoyment. The National Trust undertook negotiations for acquiring the property in the course of last summer, and in response to an appeal made by Canon Rawnsley the stipulated price of 7,000*l.* was subscribed in a shorter period than five months.——Bishop's Park, by the riverside at Fulham, which was recently acquired for 35,245*l.* (including a contribution of 17,500*l.* from the London County Council), is to be enlarged by the inclusion of the adjoining Fielder's Meadow, a space of 8½ acres, at a further cost of 10,957*l.*, to cover the laying-out of the land and the embanking of the river front. The Local Municipal Authority provide 4,957*l.* towards that amount, and the remainder will, under certain conditions, be defrayed by the Council.——Mr. W. P. Griggs, a member of the Essex County Council, has presented to the public a bridge which has just been built across the river Roding, and supplies a direct access to Wanstead Park from Ilford, where the Urban Council have purchased, as pleasure-grounds, 10 acres of the Cranbrook Park estate, to Wanstead Park. This new public resort constitutes the fifth public park in the Ilford district.——On July 15 Princess Christian opened the Alexandra Gardens by the riverside at Windsor, on a site acquired by the Town Council, and which have been tastefully laid out, with fountains and a band stand, mainly at the charges of Sir Francis Tress Barry, M.P. for the borough.——At Eastbourne was opened, on August 12 last, the Hampden Park, consisting of an estate of 82 acres, within 1½ miles distant from the sea, which Mr. Freeman Thomas, M.P. for Hastings, has made over to the Corporation for the nominal sum of 3,000*l.* Mr. Golding, landscape gardener, laid out the park, in which a lake 4 acres in extent has been formed out of an old decoy for wild ducks.——The Corporation of Stockport are about to lay out the Cale Green Park, 6 acres, which Mr. Henry Bell has presented to the burgesses.——Mr. Councillor S. Turner, Mayor of Rochdale, having bought Mount Falinge Park from the late Mr. E. A. N. Royds's trustees, will present it to the borough upon certain stated conditions for ensuring its enjoyment in quietude by the public. Mr. Turner will, in addition, expend in the laying out and planting of the park a sum of about 2,500*l.*, and the Corporation agree to build the walls and otherwise adapt the grounds for the uses intended at an estimated outlay of 6,500*l.* Within the grounds, of nearly 19 acres, is a large mansion, which would serve for an art gallery or museum.—On August 30 was opened a public garden near the northern entrance into the new Blackwall Tunnel, acquired for about 4,500*l.* mainly at the charges of the London County Council. Of the two portions into which the playground is divided, that for girls and infants has a sand-pit; skirting the east side is a high wall of the East India Dock, along which a private road is let at a nominal rent by the London and East India Docks Company, and forms a gravelled terrace overlooking the two playgrounds.

## *CAPITAL AND LABOUR.*

BURTON MASONS' STRIKE.—The masons' strike at Burton-on-Trent, which began five months ago for 8½*d.* instead of 8*d.* per hour, has practically come to an end. The men agreed to accept whatever the Board of Trade arbitrator might decide.

PENRHYN QUARRY DISPUTE.—The following is a copy of a letter sent by Lord Penrhyn to Mr. Henry Jones, Bethesda:—"Sir,—The copy of a resolution forwarded by you as chairman of a meeting of some of my 'late quarrymen,' held at Beth-

esda on Saturday last, has been received by me. In replying to the inquiry as to whether I 'would be prepared to accept the services of the Right Hon. A. J. Balfour or the Right Hon. Lord Rosebery or both as conciliators,' I must beg to point out that the chief ground of complaint made against myself by the strikers (and emphasised by your own primary reference to it at the Bethesda meeting) has throughout appeared to be based on my refusal to recognise a certain committee described as 'The Quarry Committee,' but my refusal on that point does not deprive the men of their right of combination for the representation of grievances, &c., as was clearly defined in Clause I. of the terms of settlement dated August 18, 1897, and I cannot admit that the matter is one for outside interference. I have always held, and for sufficient reasons still hold, the opinion that I have acted justifiably in refusing to recognise the authority or to sanction the pretensions of the said Committee; and I regret I must decline to accede to the suggestion that I should avail myself of the services of either of the gentlemen named in the resolution.—(Signed) PENRHYN."

## *LEGAL.*

### TYNEMOUTH BUILDING BY-LAWS.

AT North Shields, on the 3rd inst., Mr. J. T. Alexander, architect, was summoned for breaking a certain by-law made by the Tynemouth Corporation with regard to the level, width, and construction of new streets, and the provisions for the sewerage thereof, in that he laid out and formed a new street, to wit, King Edward-road, of a less width than 40 ft., as required by the by-law. Mr. H. A. Adamson, the Town Clerk, appeared on behalf of the Corporation in support of the summons, and Mr. G. R. Duncan represented the defendant.

Mr. Adamson said that in May last year Mr. Alexander submitted plans for some villas proposed to be erected in front of Holy Saviour's Church at Tynemouth. It was observed, however, that the buildings were brought further forward than was shown by the estate plan. A new sketch plan was therefore sent in by Mr. Alexander, whose attention had been drawn to the matter, showing that he was going to leave a 40 ft. street. That plan was subsequently approved by the authorities, but in building the boundary wall, instead of leaving 40 ft., the width had been narrowed down in one part to 37 ft. 4 in.

Mr. J. F. Smillie, Borough Surveyor, gave evidence bearing out the above statement.

Mr. Armstrong, Assistant Surveyor, also gave evidence.

Mr. Duncan, for the defence, contended that Mr. Alexander had only built up to the boundary of the land conveyed to him from the Duke of Northumberland.

Mr. Alexander, in his evidence, said the boundary wall was built exactly on the site of the old wall, and did not encroach upon the footpath or highway.

The magistrates having conferred in private, Mr. S. O. Morrison said they had decided that there was an infringement of the by-law, and the defendant would be fined 20s. and costs.

### THE KENT BRICKMAKING INDUSTRY.

A CASE of considerable interest to the Kent brickmaking trade was heard on the 8th inst. at the Sittingbourne Petty Sessions. Messrs. Smeed, Dean, & Co., Ltd., of Sittingbourne, were summoned by the Sittingbourne Urban District Council, under the Public Health Act of 1875, by reason of a nuisance arising from a large accumulation of London refuse upon their brickfield. On July 1, this heap of refuse, which was 40 yards long, 30 yards wide, and 2 yards high, and is about 1,200 yards or 1,300 yards from the Town Hall, became ignited, and the fumes beat down into the town, causing much discomfort to the inhabitants. Mr. S. G. Lushington prosecuted on behalf of the Sittingbourne Council, and Mr. G. D. Lynch was counsel for the defendant company. The evidence showed that correspondence had passed between the Council and the firm upon the subject, but no attempt had been made to put out the fire. Proceedings then followed. The London refuse, it was stated, consisted of the garbage and filth of the Metropolis, and the smell emitted from this when burning was unbearable. It was contended that this refuse was the rough stuff which had been sifted after the ashes used in the burning of bricks had been taken from it, and that for purposes of brickmaking it was useless. It was suggested that the defendants might have put up a destructor, as had already been done by one local firm with success, or they might have cut a trench through the heap and separated the burning portion, extinguishing the same with water or smothering it with earth. To all of these suggestions it was stated that those methods had been tried on previous occasions, and that the remedy was worse than the disease. Evidence in support of the prosecution was given by Mr. W. L. Grant (Surveyor), Dr. H. G. Sutton (Medical Officer of Health), Drs. F. Grayling and R. M. Boodle, and Mr. F. G. Gibson (Chairman of the Council), who spoke of the acrid, pungent nature of the smoke emitted from the refuse, which carried a long distance. The principal witness for the defence was Mr. George Andrews, the manager, who said that his firm employed 1,400 hands and paid from 70,000*l.* to 80,000*l.* every year in wages. For the past fifty years the firm had burnt "rough stuff" without any prejudicial effect to health. What the public suffered from was, he maintained, the smell of the open sewer discharging crude sewage into the creek, of which complaints had been made by his firm to the Council for years. No attempt had been made by the defendants to put out the fire, as it was impossible to do so. It was stated that men working among the "rough stuff" had not suffered in health, but they had done so in consequence of the foul exhalations of the open sewer. The Court held that the case had been proved, and the defendants were fined 20s., were ordered to prevent a recurrence of the nuisance, and were mulcted in costs to the extent of ten guineas. Notice of appeal to the Quarter Sessions was given.—*Times.*

## RECENT PATENTS:

### ABSTRACTS OF PATENTED INVENTIONS.

9,298.—ROAD SCRAPING AND SWEEPING MACHINES: *A. Schmidt.*—Brushes mounted upon cross-bars attached to bands, of which the teeth engage with recesses in discs, sweep mud and dust up pivoted shovels to buckets that are pivoted on to lugs of a toothed band passed around recessed discs and, just before their contents are discharged into a receiver, are bent backwards against the force of springs. Chain-gearing from one of the vehicle wheels drives two elevators. If shovels are employed, the bottom of the elevator is enclosed within a chamber that runs upon wheels, and has pins that engage with slots in the sides of the machine. A T-shaped brush elevator is adapted for cleaning the grooves of street-railway lines.

9,317.—APPARATUS FOR OPENING AND CLOSING VENTILATORS, DOORS, &C.: *H. C. Pruce.*—For the valve-mechanism of pneumatical cylinders is provided a three-way cock to direct compressed air from the supply-pipe to two pipes which are connected to the closing and opening cylinders respectively, right and left-handed screw plugs that are worked with cranks work the exhaust valves, a rod joining the cranks—is reciprocated with a pivoted lever which is joined to a crank upon the three-way cock so that the exhaust-valve of the one pipe will be opened when compressed air is turned by the cock into the other pipe, and vice versâ.

9,383.—MECHANISM FOR ROPES OF LIFTS, &C.: *C. Becher.*—One winding-rope is passed around one lower and two upper sheaves and also around a tension-pulley acted upon with a weight, whilst the other and larger rope is carried over upper and lower sheaves in turn and thence to a sheave mounted upon an adjustable trolley and so around two sheaves, one above the other, to the second cage.

9,360.—MEANS OF ESCAPE FROM FIRE: *C. Schmidt.*—For use, the ends of two ropes are taken out of their casings and fastened to the ends of a stout rope which is secured to the rescuing-cage. The ropes are passed around pulleys at the top of the building. The apparatus will serve for firemen's use as well.

9,376.—PLATES OF IMITATION MARBLE: *J. Czermak.*—On to a glass plate is applied a thin layer of cement, plaster of Paris, and so on, as a paste, which has been coloured to represent the ground of a natural marble. When the layer has become set it is broken and the pieces are shifted about, the fissures are filled with a liquid cement coloured as marble veins, and more cement is then laid on. Strongly curved veins are formed by making the thin layer with a varying thickness, and for differently-coloured veins the plates of cement should be broken several times.

9,437.—SHAFT KILNS AND OVENS: *F. Crosland.*—For calcining cement, lime, gypsum, &c., the kilns are formed with their interior oblongs set in cross-section, and sinuously, in order to give a similar course to the products of combustion, and to cause the material to roll over as it falls. The major axis of one cross-section at the top should be disposed at a right angle to the major axis of a section through the apertures for supply of gas, the intervening sections being inclined at corresponding angles between.

9,471.—SPIGOT, AND SOCKET, AND EXPANSION PIPE-JOINTS: *G. F. Ryan.*—The joints, which are especially intended for metallic and non-metallic articles, comprise an expansion joint for an earthenware sewer-pipe, and a metallic soil-pipe, and a joint for the cleaning out connexion of a sewer pipe. In the latter instance, a metallic collar, which surrounds the socket flange, is fashioned in two portions that are to be bolted to one another, a closing lid which is bevelled at the end of the flange is bolted on to the ring. An outwardly curved flange constitutes an enlarged socket that takes the jointing portions, and is surrounded by a metallic collar upon which are lugs for screw-bolts. The flattened flange of the ring presses against an annular seat, packing being interposed. Another ring is forced against the gasket, and is bolted on to lugs upon the collar. In another form, a metallic socket is bolted on to the straight or plain earthenware pipe.

9,485.—A VALVE FOR VENTILATION APPARATUS: *C. Weiss.*—The invention is for maintaining in all positions parallel to its seating the regulator valve or damper of ventilation-openings, heating flues, and similar passages. The remoter ends of parallel-motion links are pivoted on to the inner side of valve-framing to which the links join the valve, whilst the outer ends of the links are pivoted on to the back of the valve-plate, the joints being made stiff enough to retain the valve in its place as set; in another adaptation the valve is provided with a counter-sunk seating, and the frame has a moulded section.

9,523.—FITTINGS FOR SINKS, LAVATORY-BASINS, &C.: *L. Kosiol and S. F. Randall.*—The piston at the lower end of the pull-rod for the waste-service is fashioned with an annular port through it, a round flange beneath is trapped in a bowl which is mounted upon an extension-piece from the lower end of the pull-rod which will slide against the force of a spring fitted within the piston. A depression of the rod forces the bowl on to its seating whereby the annular flange will be closed against the bottom of the bowl.

9,527.—FUSE CASES OR BOXES AND THEIR FITTINGS: *D. & W. Fuse Co.*—The fuse is mounted on one of the two parts that constitute the box, and the live terminals are mounted on the other part, the closing of the box completes the connexion. In one shape a trough of some insulating material for the live terminals is placed in the box and forked contacts are made secure, an insulating block having terminals with blade contacts is attached to to the lid of the box, the fuse being fastened to those terminals; otherwise some subdivisions for the several fuses are made in the box and its lid.

9,552.—WOODEN FLOORING AND PAVING BLOCKS: *H. Cooley.*—The inventor devises means of allowing for contraction and expansion of wooden blocks by inserting channel irons and springs alternately between the blocks and concrete or wood; one channel iron may be fashioned at its upper end with a flange that will take the flange of the other iron, and drainage can be facilitated by indenting the bottom of the angle-iron.

9,555.—FREEZING-TUBES FOR USE IN DRIVING TUNNELS AND SIMILAR WORKS: *A. Gobert and J. H. Merivale.*—For the driving of tunnels and the sinking of pits through quicksands by the freezing system the liquid is caused to flow through freezing-tubes which are disposed in series instead of parallel-wise, and are so spaced apart as to be nearer to one another where they are more remote from the cold-centre. The current may flow from different tubes in turn, or its direction may be reversed. The outlet pipes are fitted with thermometers, and, in one modification, any tube of a group of three can be removed out of the series, the valves being arranged accordingly.

9,595.—ATTACHMENTS FOR TELEGRAPH, TELEPHONE, AND SIMILAR WIRES: *O. Austen.*—The wires are secured to insulators and so on by means of a plate which constitutes a fixed jaw with gripping surfaces, and there is a sliding jaw-plate to be worked with a pivoted cane and a lever. As the jaws grip the wire the fastening is retained in position through the similar action of the lever exerted through a wire or spring.

9,607.—ROLL-CAPS AND OTHER FITTINGS FOR ROOFING PURPOSES: *F. Green.*—The curled edges of the roll-caps slide over the flanged edges of metallic sheets, and screws or nails driven through tongues and extensions secure flanged weather-pieces to the ends of the wooden battens or rolls; each weather-piece is turned upwards against the upper roll, and nailed, after a screw has been driven through the tongue and cap into the lower wooden roll, and it is so indented or dished that it will fit over the screw-head. The sides of the sheets are attached with clips to the rolls, and curled or welted joints join the upper and lower edges of the sheets to one another and also to the end-caps, which can be either left to slide freely or made fast with welted joints; otherwise, the end-piece has wings that are turned so as to clip the flanged end of the cap.

9,617.—PROCESS OF MOULDING ARTICLES OF CEMENT: *A. C. Davis.*—A hopper feeds the material to between rollers, water being supplied from a tank within the hopper, whence the cement is conveyed by means of rotating mixing-blades to the mould underneath; when the die or plunger has pressed a block a loose and lever-worked bottom ejects the block from the mould; provision is made for regulating the amounts of relative parts of cement and water for the making of standard blocks or samples for testing purposes.

9,624.—BATHS (DOMESTIC): *T. Pickup and J. Bradley.*—Trunnions and standards support the bath, which when not needed for use can be turned up out of the way so as to enclose the heater or to be itself enclosed; a socket on the top of the waste-pipe takes the outlet; for a water-heater the inventors place the upper part of the boiler in communication with an annular cone-shaped chamber, and connect the inner sides of the latter by means of transverse tubes; between the boiler and the outer casing is a passage for heated air, and tubes from that space are inserted through the upper boiler.

9,739.—PROCESS OF SLAKING LIME: *F. A. Benz and T. Heinrigs.*—A worm conveys the lime to a container, wherein it is stirred with agitators and slaked with water and steam. It is then transferred into tapered receivers to be completely slaked and dried by its own heat. After the draw-plates are pulled aside, the lime is screened in a cylindrical chamber, and all impurities are discharged.

9,793.—DRAWING COMPASSES: *L. Myers.*—Flaps that will form a three-sided socket for the end of the leg are fashioned on the socket, which is stamped out of a blank. A tongue which engages with a hole in the leg fastens the holder or socket. Two discs, between which the legs are pivoted, are hung from the middle handle, and projections from the nut prevent it from being turned.

9,811.—SIPHONICAL DISCHARGE: *E. Jones and T. H. Moore.*—The starting of the siphon, which is trapped, is effected by the opening of a valve at the lower end of a curved pipe which passes through the tank into the crown of the siphon, and will allow the escape of air from the crown. A spring that moves inside a cylinder retains the piston of the valve upon its seating, and there are openings through which the air can escape. The valve is opened by pulling down a handle against the action of the spring that is coiled around it within the cylinder.

9,828.—A SUBSTITUTE FOR BOILED LINSEED OIL: *S. Ammundsen.*—The substitute for boiled linseed oil is intended for use in the mixing of paints and also in the coating of metals and damp surfaces. It is compounded of soap solution, casein, slaked lime, water, oil of turpentine, with the addition, it may be, of ammonia, in order to obviate the settling out of the casein and lime.

9,891.—CONSTRUCTION OF CONCRETE BUILDINGS: *T. C. Farrell.*—In building walls, piers, columns, &c., the concrete is retained with planks that are held together by means of flanged shoes that have the shape of H in their cross-section, and in their plan are either forked, angular, straight, or T-shaped. Rounded transverse ribs, fashioned upon the webs of the shoes, are pierced for connecting-bolts, and the planks are kept in position by spikes upon the cross-ribs.

9,812.—MANUFACTURE OF ARTIFICIAL STONE: *H. E. Carter.*—The blocks are described as being available for building, paving, flooring, wall-lining, and cognate uses. They are formed of an admixture of either cement or sand, broken stone and brick, clay, loam, and so on, with sodium, potassium or other alkaline silicate, and water. The dried blocks are then treated with a solution of calcium chloride.

## MEETINGS.

SATURDAY, SEPTEMBER 13.

*Architectural Association.*—Sixth summer visit, to view Church and Monastery of St. Francis, Bocking Bridge, Essex, by the late Mr. J. F. Bentley.

*Incorporated Association of Municipal and County Engineers.*—Yorkshire District meeting, Shipley.

WEDNESDAY, SEPTEMBER 17.

*Builders' Foremen and Clerks of Works' Institution.*—Ordinary meeting of the members. 8 p.m.

SEPTEMBER 15 TO SEPTEMBER 20.

*British Archæological Association.*—Fifty-ninth Annual Congress, Westminster and Home Counties.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

August 28.—By ALEXANDER BERRYMAN (at Penzance).

Sennen, Cornwall.—The Skewjack Estate, 200 a., f., y.r. 17*l.* ..... £5,500

September 1.—By DOUGLAS YOUNG & CO. (at Southwold).

Southwold, Suffolk.—Hotson-rd., 15 plots of building land, f. ..... 1,075
Station-rd., four plots of building land, f. ..... 374
North-rd., fifteen plots of building land, f. ..... 635

September 2.—By DEBENHAM, TEWSON, & CO.

Hunsdon, Herts.—Briggens Park Estate, 206 a. 2 r. 9 p., u.t. 19 yrs., y.r. 650*l.*, with sporting rights ..... 3,400
Five freehold cottages, e.r. 45*l.* 10s. ..... 620

By G. LOVEITT & SONS (at Coventry).

Coventry, Warwick.—Payne's-lane, freehold factory premises, area 1,549 yds. (including plant, machinery, &c.) ..... 2,700
Stoke-green, a freehold residence, area 1,160 yds., p. ..... 500
Wolston, Warwick.—Freehold house and shop, p. ..... 205

By E. J. LANE.

New Cross.—5 and 6, Brocklehurst-st., u.t. 52 yrs., g.r. 6*l.*, w.r. 6*s.* 6*d.* ..... 630
19 and 20, Brocklehurst-st., u.t. 55 yrs., g.r. 7*l.*, w.r. 6*s.* 8*d.* ..... 630

*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

## PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

### BRICKS, &c.

| | £ s. d. | |
|---|---|---|
| Hard Stocks .... | 1 13 0 | per 1,000 alongside, in river |
| Rough Stocks and Grizzles ..... | 1 10 0 | ,, ,, ,, |
| Facing Stocks .... | 2 12 0 | ,, ,, ,, |
| Shippers ..... | 2 5 0 | ,, ,, ,, |
| Flettons ..... | 1 8 0 | ,, at railway depôt |
| Red Wire Cuts .. | 1 12 0 | ,, ,, ,, |
| Best Fareham Red | 3 12 0 | ,, ,, ,, |
| Best Red Pressed Ruabon Facing. | 5 5 0 | ,, ,, ,, |
| Best Blue Pressed Staffordshire .. | 4 6 6 | ,, ,, ,, |
| Do., Bullnose .... | 4 11 0 | ,, ,, ,, |
| Best Stourbridge Fire Bricks .... | 4 8 0 | ,, ,, ,, |
| GLAZED BRICKS. | | |
| Best White and Ivory Glazed Stretchers..... | 13 0 0 | ,, ,, ,, |
| Headers ..... | 12 0 0 | ,, ,, ,, |
| Quoins, Bullnose, and Flats ..... | 17 0 0 | ,, ,, ,, |
| Double Stretchers | 19 0 0 | ,, ,, ,, |
| Double Headers.. | 16 0 0 | ,, ,, ,, |
| One Side and two Ends ..... | 19 0 0 | ,, ,, ,, |
| Two Sides and one End ..... | 20 0 0 | ,, ,, ,, |
| Splays, Chamfered, Squints..... | 20 0 0 | ,, ,, ,, |
| Best Dipped Salt Glazed Stretchers and Headers .. | 12 0 0 | ,, ,, ,, |
| Quoins, Bullnose, and Flats ..... | 14 0 0 | ,, ,, ,, |
| Double Stretchers | 15 0 0 | ,, ,, ,, |
| Double Headers.. | 14 0 0 | ,, ,, ,, |
| One Side and two Ends ..... | 15 0 0 | ,, ,, ,, |
| Two Sides and one End ..... | 15 0 0 | ,, ,, ,, |
| Splays, Chamfered, Squints..... | 14 0 0 | ,, ,, ,, |
| Seconds Quality White and Dipped Salt Glazed.... | 8 0 0 | ,, less than best. |
| Thames and Pit Sand ..... | 7 | 0 per yard, delivered. |
| Thames Ballast ..... | 6 | 0 ,, ,, |
| Best Portland Cement ..... | 31 | 0 per ton, delivered. |
| Best Ground Blue Lias Lime.. | 22 | 0 ,, ,, |

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 27s. 0d. per ton at rly. dpt.

### STONE.

| | s. d. | |
|---|---|---|
| Ancaster in blocks .... | 1 11 | per ft. cube, deld. rly. depot |
| Bath ,, .... | 1 7 | ,, ,, |
| Farleigh Down Bath .. | 1 8 | ,, ,, |
| Beer in blocks .... | 1 6 | ,, ,, |
| Grinshill ,, .... | 1 10 | ,, ,, |
| Brown Portland in blocks | 2 2 | ,, ,, |
| Darley Dale in blocks.. | 2 4 | ,, ,, |
| Red Corsehill ,, | 2 5 | ,, ,, |
| Closeburn Red Freestone | 2 3 | ,, ,, |
| Red Mansfield ,, | 2 4 | ,, ,, |
| Hard York in blocks .. | 2 10 | ,, ,, |
| ,, ,, 6 in. sawn both sides landings, to sizes (under 40 ft. sup.) | 2 8 | per ft. super. at rly. depôt. |
| ,, ,, 6 in. Rubbed Ditto.. | 3 0 | ,, ,, |
| ,, ,, 3 in. sawn both sides slabs (random sizes) | 1 3 | ,, ,, |
| ,, ,, 2 in. self-faced Ditto | 0 9½ | ,, ,, |
| Hopton Wood (Hard Bed) in blocks | 2 | 3 per ft. cube. deld. rly. depôt |
| ,, ,, ,, 6 in. sawn both sides landings | 2 | 7 per ft. super. deld. rly. depôt. |
| ,, ,, ,, 3 in. do. | 1 | 2½ ,, ,, |

### SLATES.

| in. | in. | £ s. d. | |
|---|---|---|---|
| 20 × 10 best blue Bangor.. | 12 | 0 0 | per 1000 of 1200 at rly. dep |
| ,, best seconds ,, | 11 | 10 0 | ,, ,, |
| 16 × 8 best ,, | 6 | 17 6 | ,, ,, |
| 20 × 10 best blue Portmadoc .. .. | 11 | 7 6 | ,, ,, |
| 16 × 8 best blue Portmadoc | 6 | 5 0 | ,, ,, |
| 20 × 10 best Eureka unfading green.... | 13 | 10 0 | ,, ,, |
| 16 × 8 ,, ,, | 7 | 10 0 | ,, ,, |
| 20 × 10 permanent green | 10 | 10 0 | ,, ,, |
| 16 × 8 ,, ,, | 6 | 0 0 | ,, ,, |

### TILES.

| | s. d. | |
|---|---|---|
| Best plain red roofing tiles.. | 41 | 6 per 1,000, at rly. depôt. |
| Hip and valley tiles.... | 3 | 7 per doz. ,, ,, |
| Best Broseley tiles ..... | 45 | 6 per 1,000 ,, ,, |
| Hip and valley tiles.... | 4 | 0 per doz. ,, ,, |
| Best Ruabon Red, brown or brindled Do. (Edwards) | 57 | 6 per 1,000 ,, ,, |
| Do. ornamental Do. .... | 60 | 0 ,, ,, ,, |
| Hip tiles ..... | 4 | 0 per doz. ,, ,, |
| Valley tiles ..... | 3 | ,, ,, ,, |
| Best Red or Mottled Staffordshire Do. (Peakes) . | 50 | 9 per 1,000 ,, ,, |
| Hip tiles ..... | 4 | 1 per doz. ,, ,, |
| Valley tiles..... | 3 | 8 ,, ,, ,, |

### WOOD.

BUILDING WOOD.—YELLOW.

| | At per standard. £ s. d. | £ s. d. |
|---|---|---|
| Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in..... | 14 10 0 | 16 0 0 |
| Deals: best 3 by 9..... | 13 10 0 | 15 0 0 |
| Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in..... | 10 10 0 | 11 10 0 |
| Battens: best 2½ by 6 and 3 by 6 ... | 9 10 0 | less than 7 in. and 8 in. |
| Deals: seconds ..... | 1 0 0 | less than best |
| Battens: seconds ..... | 9 10 0 | ,, ,, ,, |
| 2 in. by 4 in. and 2 in. by 6 in. ... | 8 10 0 | 9 10 0 |
| 7 in. by 4½ in. and 2 in by 5 in. ... | 8 0 0 | 9 0 0 |

### PRICES CURRENT (*Continued*).

WOOD.

| | At per standard. £ s. d. | £ s. d. |
|---|---|---|
| Foreign Sawn Boards— 1 in. by 12 in. by 12 in. ..... | 0 10 0 | more than battens. |
| 3 in. ..... | 1 0 0 | ,, |
| Fir timber: Best middling Dantzig or Memel (average specification) ..... | At per load of 50 ft. 4 10 0 | 5 0 0 |
| Seconds ..... | 4 5 0 | 4 10 0 |
| Small timber (8 in. to 10 in.) .... | 3 12 6 | 3 15 0 |
| Swedish balks..... | 2 15 0 | 3 0 0 |
| Pitch-pine timber (50 ft.)..... | 3 0 0 | 3 10 0 |
| JOINERS' WOOD. | At per standard. | |
| White Sea: First yellow deals, 3 in. by 11 in. ..... | 22 0 0 | 23 0 0 |
| 3 in. by 9 in. ..... | 20 0 0 | 21 0 0 |
| Battens, 2½ in. and 3 in. by 7 in. | 16 10 0 | 18 0 0 |
| Second yellow deals, 3 in. by 11 in. | 18 0 0 | 20 0 0 |
| ,, ,, 3 in. by 9 in. | 16 10 0 | 18 10 0 |
| Battens, 2½ in. and 3 in. by 7 in. | 13 0 0 | 14 0 0 |
| Third yellow deals, 3 in. by 11 in. and 9 in. ..... | 14 0 0 | 15 10 0 |
| Battens, 2½ in. and 3 in. by 7 in. | 11 10 0 | 12 10 0 |
| Petersburg: first yellow deals, 3 in. by 11 in. ..... | 20 0 0 | 21 0 0 |
| Do. 3 in. by 9 in. ..... | 17 0 0 | 18 0 0 |
| Battens..... | 13 0 0 | 14 0 0 |
| Second yellow deals, 3 in. by 11 in..... | 15 0 0 | 16 10 0 |
| Do. 3 in. by 9 in. ..... | 13 10 0 | 14 10 0 |
| Battens..... | 11 0 0 | 12 0 0 |
| Third yellow deals, 3 in. by 11 in..... | 12 10 0 | 13 10 0 |
| Do. 3 in. by 9 in. ..... | 12 0 0 | 13 0 0 |
| Battens..... | 10 0 0 | 11 0 0 |
| White Sea and Petersburg:— | | |
| First white deals, 3 in. by 11 in. | 14 0 0 | 15 0 0 |
| ,, ,, 3 in. by 9 in. | 12 0 0 | 14 0 0 |
| Battens..... | 11 0 0 | 12 0 0 |
| Second white deals 3 in. by 11 in. | 13 0 0 | 14 0 0 |
| ,, ,, ,, 3 in. by 9 in. | 12 0 0 | 13 0 0 |
| ,, ,, battens..... | 9 10 0 | 10 10 0 |
| Pitch-pine: deals ..... | 16 0 0 | 18 0 0 |
| Under 2 in. thick extra ..... | 0 10 1 | 0 0 0 |
| Yellow Pine—First, regular sizes.. | 32 0 0 | 33 10 0 |
| Broads (12 in. and up)..... | 3 0 0 | more. |
| Oddments ..... | 22 0 0 | 24 0 0 |
| Seconds, regular sizes ..... | 24 10 0 | 26 10 0 |
| Yellow Pine Oddments ..... | 20 0 0 | 22 0 0 |
| Kauri Pine—Planks, per ft. cube.. | 0 3 6 | 0 4 6 |
| Dantzig and Stettin Oak Logs— Large, per ft. cube ..... | 0 6 | 0 3 0 |
| Small ,, ,, ..... | 0 2 3 | 0 2 6 |
| Wainscot Oak Logs, per ft. cube .. | 0 5 0 | 0 5 6 |
| Dry Wainscot Oak, per ft. sup. as inch ..... | 0 0 7½ | 0 0 8 |
| ¾ in. do. do. .... | 0 0 7 | - - - |
| Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch ..... | 0 0 9 | 0 0 11 |
| Selected, Figury, per ft. sup. as inch ..... | 0 1 6 | 0 2 0 |
| Dry Walnut, American, per ft. sup. as inch ..... | 0 0 10 | 0 1 0 |
| Teak, per load ..... | 16 0 0 | 20 0 0 |
| American Whitewood Planks— Per ft. cube..... | 0 3 0 | 0 3 6 |
| Prepared Flooring— | Per square. | |
| 1 in. by 7 in. yellow, planed and shot ..... | 0 13 0 | 0 16 6 |
| 1 in. by 7 in. yellow, planed and matched ..... | 0 13 6 | 0 17 6 |
| 1¼ in. by 7 in. yellow, planed and matched ..... | 0 15 0 | 1 0 0 |
| 1 in. by 7 in. white, planed and shot ..... | 0 11 0 | 0 12 6 |
| 1 in. by 7 in. white, planed and matched ..... | 0 11 6 | 0 13 6 |
| 1¼ in. by 7 in. white, planed and matched ..... | 0 13 6 | 0 15 6 |

6 in. at 6d. per square less than 7 in.

### JOISTS, GIRDERS, &c.

| | In London, or delivered Railway Vans, per ton. £ s. d. | £ s. d. |
|---|---|---|
| Rolled Steel Joists, ordinary sections | 6 5 0 | 7 5 0 |
| Compound Girders ,, ,, | 8 2 6 | 9 5 0 |
| Angles, Tees and Channels, ordinary sections ..... | 7 17 6 | 8 17 6 |
| Flitch Plates ..... | 8 5 0 | 8 15 0 |
| Cast Iron Columns and Stanchions, including ordinary patterns .... | 7 2 6 | 8 5 0 |

### METALS.

| | Per ton, in London. £ s. d. | £ s. d. |
|---|---|---|
| IRON— Common Bars..... | 7 15 0 | 8 5 0 |
| Staffordshire Crown Bars, good merchant quality ..... | 8 5 0 | 8 15 0 |
| Staffordshire "Marked Bars" .. | 10 10 0 | - - - |
| Mild Steel Bars..... | 9 0 0 | 9 10 0 |
| Hoop Iron, basis price..... | 9 5 0 | 9 10 0 |
| ,, galvanised..... | 16 0 0 | - - - |

(* And upwards, according to size and gauge.

| | | |
|---|---|---|
| Sheet Iron, Black.— Ordinary sizes to 20 g..... | 10 0 0 | - - - |
| ,, ,, to 24 g..... | 11 0 0 | - - - |
| ,, ,, to 26 g..... | 12 10 0 | - - - |
| Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g..... | 12 15 0 | - - - |
| ,, ,, 22 g. and 24 g. | 13 5 0 | - - - |
| ,, ,, 26 g..... | 14 5 0 | - - - |
| Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g..... | 16 0 0 | - - - |
| ,, ,, 22 g. and 24 g. | 16 10 0 | - - - |
| ,, ,, 26 g..... | 18 0 0 | - - - |
| Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g. | 12 15 0 | - - - |
| ,, ,, 22 g. and 24 g. | 13 5 0 | - - - |
| ,, ,, 26 g. ..... | 14 5 0 | - - - |
| Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker .. | 12 0 0 | - - - |
| ,, ,, 22 g. and 24 g. | 13 0 0 | - - - |
| ,, ,, 26 g. ..... | 14 5 0 | - - - |
| Cut nails, 3 in. to 6 in. ..... | 9 5 0 | 9 15 0 |

(Under 2 in. usual trade extras.)

[*See also page 239.*

# COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

*(For some Contracts, &c., still open, but not included in this List, see previous issues.)*

## COMPETITIONS.

| Nature of Work. | By whom Advertised. | Premiums. | Designs to be delivered |
|---|---|---|---|
| *Technical Schools and Free Library | Ramsgate Corporation | 50*l.*, 25*l.*, and 15*l.* | No date |

## CONTRACTS.

| Nature of Work or Materials. | By whom Advertised. | Forms of Tender, &c., Supplied by | Tenders to be delivered |
|---|---|---|---|
| Diversion of Shooters Brook | Manchester Corporation | The Secretary, Rivers' Department, Town Hall, Manchester | Sep. 15 |
| *Cottages, Iron Shed, Gates, Fencing, &c. | Hendon U.D.C. | Council's Surveyor, The Burroughs, Hendon, N.W. | do. |
| *Wood-paving Works | Willesden District Council | Council's Engineer, Dyne-road, Kilburn, N.W. | Sep. 16 |
| Laundry, &c., Heanor-road | Ilkeston Hospital Committee | C. W. Hunt, Architect, 132, Station-road, Ilkeston | do. |
| Road Works, Northfield, Wibsey | | J. Cowgill, Engineer, Pearl Assurance Buildings, Bradford | do. |
| Schools, Trallwn | Pontypridd School Board | A. O. Evans, Architect, Pontypridd | do. |
| Sewerage Works, &c. (5,000 yards) | Tutbury R.D.C. | Wilcox & Raikes, Engineers, 63, Temple-row, Birmingham | do. |
| Sewerage Works, Liverpool-street, &c. | Dover Town Council | H. E. Stilgoe, Civil Engineer, Biggin-street, Dover | do. |
| Reservoirs, Pumping Stations, &c. | | J. V. Edwards, County Hall, Wakefield | do. |
| Granite and Quartzite | Aldershot U.D.C. | N. F. Dennis, Civil Engineer, Council Offices, Aldershot | do. |
| Making-up Richard-street, &c. | Crewe Town Council | G. E. Shore, Surveyor, Earle-street, Crewe | do. |
| Sewerage Works, near Burton-on-Trent | Tutbury R.D.C. | Wilcox & Raikes, Engineers, 63, Temple-row, Birmingham | do. |
| Schools, Thorpe Hamlet | Norwich School Board | C. J. Brown, Architect, Cathedral Offices, Norwich | do. |
| Wrought Iron Railings, &c., Bare | Poulton (Morecambe) Sch. Brd. | W. Tilly, 5, Morecambe-street, Morecambe | do. |
| Additions to Hospital | Ilkeston Hospital Committee | C. W. Hunt, Architect, 132, Station-road, Ilkeston | do. |
| Drainage Works, High-street, Camberley | Frimley U.D.C. | F. C. Uren, Surveyor, High-street, Camberley | do. |
| Pipe Sewers, Preston, North Shields | Tynemouth Corporation | J. F. Smillie, Surveyor, Town Hall, Tynemouth | do. |
| Road Works, Lodge-road | Croydon Town Council | E. Mawdesley, Town Hall, Croydon | do. |
| Sewerage Works, Wellington-street | Aldershot U.D.C. | N. F. Dennis, Civil Engineer, Council Offices, Aldershot | Sep. 17 |
| Nurses' Home, Ripon | | Thos. Stokes, Architect, Thirsk | do. |
| *Disposal of Breeze | Commercial Gas Co. | Company's Offices, Stepney, E. | do. |
| *Supply of Lime | do. | do. | do. |
| Filter Beds, &c., Upper Midhope | Barnsley Corporation | T. & C. Hawksley, Engineers, 30, Great George-street, S.W. | do. |
| Street Works, Beach-street, &c. | Eccles (Lancs) Corporation | Borough Surveyor, Town Hall, Eccles | do. |
| Waterworks, Collingford | Carlisle R.D.C. | J. Graham, Architect, Bank-street, Carlisle | do. |
| *Uncrimable Iron Railing, Oak Cleft Fencing with Gates | West Ham Union | The Clerk, Union Workhouse, Leytonstone, N.E. | do. |
| *Buildings at Gasworks | Devonport Corporation | Borough Surveyor, 29, Ker-street, Devonport | Sep. 18 |
| Paving Works, Seaton Delaval | Tynemouth R.D.C. | A. S. Dinning, 21, Ellison-place, Newcastle-on-Tyne | do. |
| Buildings at Gas Works | Devonport Corporation | Stevenson & Burstal, Architects, 38, Parliament-st., Westminster | do. |
| Buildings at Gas Works | do. | J. F. Burns, Borough Surveyor, 29, Ker-street, Devonport | do. |
| Tramways Materials | Reading Corporation | Bowen & Winslow, Engineers, Town Hall, Reading | do. |
| Engine and Boiler House, &c. | Swadlincote U.D.C. | G. B. Smedley, Gas Offices, Swadlincote, Burton-on-Trent | Sep. 19 |
| Road Works, Wilbraham-road, Chorlton-cum-Hardy | Withington U.D.C. | A. H. Mountain, C. E., Town Hall, West Didsbury, Lancs | do. |
| Twenty Cottages, Pontlianfraith, Wales | Tredegar Junction No. 2, Bld. Clb. | W. Phillips, Pantyceiyn, Pontlianfraith, Tredegar | do. |
| Sewerage Works, &c., Huncoat | Burnley R.D.C. | S. Edmondson, Surveyor, 18, Nicholas-street, Burnley | Sep. 20 |
| House, &c., Spring-gardens, Elland, Yorks | | R. Berry, Architect, Commercial-street, Halifax | do. |
| Artisans' Dwellings, Victoria-street, &c. | Perth Town Council | R. M'Kilitp, Burgh Surveyor, 12, Tay-street, Perth | do. |
| Granite Road Metal (3,000 tons) | Tamworth R.D.C. | H. J. Clarson, Surveyor, 22, Church-street, Tamworth | do. |
| Four Houses, Tal-y-llyn, near Brecon | Mr. J. Stephens | H. Waters, Architect, Beaufort, Brecon | do. |
| Schools, High Brooms | Southborough (Kent) School Board | C. R. Strange, Architect, 20, Dudley-road, Tunbridge Wells | Sep. 22 |
| Making-up Castle-road | Tipton (Staffs) U.D.C. | W. H. Jukes, Surveyor, Owen-street, Tipton | do. |
| Sewerage Works, Tantarra-street | Walsall Corporation | Borough Surveyor, Bridge-street, Walsall | do. |
| Additions, &c., to House, Oak Tree-lane, Selly Oak | King's Norton Guardians | E. Docker, 10, Newhall-street, Birmingham | do. |
| Sewerage Works, &c., Parsonage-road | Heaton Norris U.D.C. | W. Banks, Civil Engineer, Council Offices, Heaton Moor | do. |
| Semi-Detached Villas, Birkenshaw | | Walker & Collinson, Architects, Swan Arcade, Bradford | do. |
| *Stores, Cart & Van Sheds, Lodge, & Public Urinals | Stepney Borough Council | Borough Engineer, 15, Great Alie-street, E. | do. |
| *Wood Fencing and Gates | Willesden District Council | Council's Engineer, Dyne-road, Kilburn, N.W. | Sep. 23 |
| *Making-up Roads | Wood Green U.D.C. | Council's Surveyor, Town Hall, Wood Green | Sep. 24 |
| *Making-up, Asphalt Paving, &c., of Terrace | do. | do. | do. |
| Two Steel Girder Bridges, Hedon-rd., Kingston-on-Hull | North-Eastern Railway Co. | T. M. Newell, Engineer, Dock Office, Hull | do. |
| Electric Plant, &c. | Dungannon (Ireland) U.D.C. | J. M. Hamilton, Council Offices, Dungannon | do. |
| *Laboratories in Duke-street, Chelmsford | Essex County Council | County Architect, Duke-street, Chelmsford | Sep. 25 |
| *Erection of Turkish Bath, adjoining existing Baths | Burton-on-Trent Corporation | Borough Engineer, Town Hall, Burton-on-Trent | Sep. 27 |
| Turkish Bath Buildings | do. | G. T. Lyman, Engineer, Town Hall, Burton | do. |
| Sewerage Works | Uttoxeter U.D.C. | Wilcox & Raikes, Engineers, 63, Temple-row, Birmingham | Sep. 29 |
| *Making-up Roads | Beckenham U.D.C. | Council's Surveyor, Beckenham | do. |
| School, Normanton-road | Derby School Board | A. Macpherson, Architect, Tenant-street, Derby | do. |
| Granite Road Metal | Witham (Essex) U.D.C. | W. B. Blood, Witham | do. |
| *Additions to Sewage Outfall Works, Appledram | Chichester Corporation | Town Clerk, Chichester | do. |
| *Road Making and Paving Works, Tottenham | London County Council | Architect's Department, 19, Charing Cross-road, S.W. | Sep. 30 |
| Water Supply Works, Burythorpe, Malton | | J. H. Preston, Burythorpe House, Malton, Yorks | do. |
| *Dining Hall and Laundry Buildings at Workhouse | Richmond Union | E. J. Partridge, Architect, 30, Lincoln's-inn Fields, W.C. | Oct. 2 |
| *New County Offices, Chelmsford | Essex County Council | F. Whitmore, Architect, Duke-street, Chelmsford | do. |
| *Erection of Hotel, Sidmouth, Devon | Sidmouth Hotels Co., Ltd. | E. W. Sampson, Architect, Sidmouth | do. |
| *New Offices & Buildings for County Surveyor, Hertford | Hertfordshire County Council | County Surveyor, 41, Parliament-street, S.W. | Oct. 8 |
| *Weights & Measures Testing Office, &c., Greenwich | London County Council | Architect's Department, 18, Pall Mall East, S.W. | Oct. 14 |
| Pipes, Valves, Excavating Trenches, &c. | Scotle R.D.C. | E. Pickering, Surveyor, 11, Lowther-street, Whitehaven | Oct. 16 |
| Three Shops and House, Cranklow | | H. Senior, 58, Westgate, Rotherham | No date |
| Two Houses, Cranklow | Exeter Building Estates, Co., Ltd. | do. | do. |
| Road, Mount Radford Estate | Burnley R.D.C. | Ellis & Co., Surveyors, Bedford Chambers, Exeter | do. |
| Sewerage Works | | S. Edmondson, Surveyor, 18, Nicholas-street, Burnley | do. |
| Additions to Grove Hospital, Leighton Buzzard | | J. T. Lawrence, Architect, Leighton Buzzard | do. |
| Additions to Brewery, Cloughfold, Lancs | | J. Wilson, Architect, Bacup | do. |
| Two Houses, Thornhill Lees, Dewsbury | Saville Town Chemical Co., Ltd. | F. Dixon, Thornhill Lees, Dewsbury | do. |
| Four Cottages, Dewsbury | | The Secretary, Mill-street East, Saville Town | do. |
| Two Houses, Caldicot, Mon. | | E. Blewitt, Architect, Blaenavon, Mon. | do. |
| Schools, Beverley, Yorks | | W. J. Morley & Son, Architects, 269, Swan-arcade, Bradford | do. |

## PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Required. | Salary. | Application to be in |
|---|---|---|---|
| *Manual Training Instrs. & Asst. Instrs. in Metal Work | London School Board | 100*l.* and 80*l.* | Sep. 15 |
| *Clerk of Works | Tottenham U.D.C. | 3*l.* 3*s.* per week | Sep. 18 |
| *Assistant Lecturer in Civil Engineering | Hartley College, Southampton | 130*l.*—150*l.* | Sep. 24 |

*Those marked with an asterisk (*) are advertised in this Number.* *Competition, p. iv.* *Contracts, pp. iv. vi. viii. & x.* *Public Appointments, xxi.*

PRICES CURRENT (*Continued*).

LEAD, &c.

| | | Per ton in London. £ s. d. | £ s. d. |
|---|---|---|---|
| LEAD—Sheet, English, 3 lbs. & up. | | 13 12 6 | - - - |
| Pipe in coils | | 14 2 6 | - - - |
| Soil Pipe | | 16 12 6 | - - - |
| ZINC—Sheet— | | | |
| Vieille Montagne | ton | 24 5 0 | - - - |
| Silesian | | 24 0 0 | - - - |
| COPPER— | | | |
| Strong Sheet | per lb | 0 0 10 | - - - |
| Thin | ,, | 0 0 11 | - - - |
| Copper nails | ,, | 0 0 11 | - - - |
| BRASS— | | | |
| Strong Sheet | ,, | 0 0 9 | - - - |
| Thin | ,, | 0 0 10 | - - - |
| TIN—English Ingots | ,, | 0 1 3½ | - |
| SOLDER—Plumbers' | ,, | 0 0 6½ | - - - |
| Tinmen's | ,, | 0 0 5½ | - - - |
| Pipe | ,, | 0 0 9½ | - - - |

ENGLISH SHEET GLASS IN CRATES.

| | |
|---|---|
| 15 oz. thirds | 2½d. per ft. delivered. |
| ,, fourths | 2d. ,, ,, |
| 21 oz. thirds | 3½d. ,, ,, |
| ,, fourths | 2½d. ,, ,, |
| 26 oz. thirds | 4½d. ,, ,, |
| ,, fourths | 3½d. ,, ,, |
| 32 oz. thirds | 5½d. ,, ,, |
| ,, fourths | 4½d. ,, ,, |
| Fluted sheet, 15 oz. | 3d. ,, ,, |
| ,, 21 ,, | 4d. ,, ,, |
| ½ Hartley's Rolled Plate | 1½d. ,, ,, |
| ⅜ ,, ,, ,, | 2½d. ,, ,, |
| ½ ,, ,, ,, | 2½d. ,, ,, |

| OILS, &c. | | £ s. d. |
|---|---|---|
| Raw Linseed Oil in pipes or barrels | per gallon | 0 2 8 |
| ,, ,, ,, in drums | ,, | 0 2 11 |
| Boiled ,, ,, in pipes or barrels | ,, | 0 2 10 |
| ,, ,, ,, in drums | ,, | 0 3 1 |
| Turpentine, in barrels | ,, | 0 2 10 |
| ,, in drums | ,, | 0 3 0 |
| Genuine Ground English White Lead | per ton | 21 0 0 |
| Red Lead, Dry | ,, | 20 0 0 |
| Best Linseed Oil Putty | per cwt. | 0 8 6 |
| Stockholm Tar | per barrel | 1 12 0 |

| VARNISHES, &c. | Per gallon. £ s. d. |
|---|---|
| Fine Pale Oak Varnish | 0 8 0 |
| Pale Copal Oak | 0 10 6 |
| Superfine Pale Elastic Oak | 0 12 6 |
| Fine Extra Hard Church Oak | 0 10 6 |
| Superfine Hard-drying Oak, for Seats of Churches | 0 14 0 |
| Fine Elastic Carriage | 0 12 6 |
| Superfine Pale Elastic Carriage | 0 16 0 |
| Fine Pale Maple | 0 16 0 |
| Finest Pale Durable Copal | 0 18 0 |
| Superfine Pale Copal Body | 1 4 0 |
| Extra Pale French Oil | 1 1 0 |
| Eggshell Flatting Varnish | 0 18 0 |
| White Copal Enamel | 1 4 0 |
| Extra Pale Paper | 0 18 0 |
| Best Japan Gold Size | 0 10 6 |
| Best Black Japan | 0 16 0 |
| Oak and Mahogany Stain | 0 9 0 |
| Brunswick Black | 0 8 6 |
| Berlin Black | 0 16 0 |
| Knotting | 0 10 0 |
| French and Brush Polish | 0 16 0 |

## TO CORRESPONDENTS.

W. R. (Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

*We cannot undertake to return rejected communications.*

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

## TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l*., unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERDEEN.—For extensions to water supply works, Cults. Messrs. Walker & Duncan, C.E., 3, Golden-square, Aberdeen :—

Wm. Durward, Portlethen* ..... £1,020

AMBLE.—For the improvement of Woodbine-street, for the Urban District Council. Mr. W. Gibson, surveyor, 31, Queen-street, Amble :—

Edward Coulson, Queen-street, Amble ..... £189

ARUNDEL.—For alterations to, and fitting up, shop for the International Tea Co., Ltd., Tarrant-street. Messrs. William Eve & Sons, architects, 10, Union-court, Old Broad-street, E.C. :—

| | |
|---|---|
| Rendel | £663 |
| Billimore | 610 |
| Vigor & Co. | 511 |
| Newberry | 510 |
| Edgoose | 495 |
| Haslemere Builders, Ltd., Haslemere, Surrey* (revised to £395) | 475 |
| Cadman (revised to £417) | 467 |

BARNET.—For the supply of road metal, &c., for the East Barnet Valley Urban District Council. Mr. Henry York, C.E., Council Offices, Barnet :—

| | Leicestershire granite. Per ton. s. d. |
|---|---|
| Mountsorrel Granite Co.* | 11 3 |
| Whitwick Granite Co. | 11 10 |
| H. L. Cooper | 11 3 |
| Cliffe Hill Granite Co. | 11 1 |
| Croft Granite, Brick, and Concrete Co. | 11 6 |
| Enderby & Stoney Stanton Granite Co. | 11 6 |
| W. Griffiths & Co. | 11 10 |
| Ireland & Knight | 12 0 |
| | Alderney. |
| G. Sommerfeld | 13 11 |
| | Basalt. |
| London & Basalt Stone Co. | 12 10 |
| | Cornish. |
| St. Keverne Stone Co. | 13 11 |
| | Guernsey. |
| W. Griffiths & Co. | 14 7 |
| | Scotch. |
| G. Sommerfeld | 11 1 |
| *Gravel.* | |
| Wallace & Tuns, Hitchin* | 4 3 |
| H. Brazier | 5 0 |
| J. Smart | 4 5 |
| *Shingle.* | |
| Wallace & Tues, Hitchin* | 4 0 |
| H. Brazier | 4 2 |
| J. Smart | 4 10 |
| *Hoggin.* | |
| | Common. |
| Wallace & Tuns* | 3 6 |
| | Double screened. |
| Wallace & Tuns* | 4 0 |
| | Common. |
| H. Brazier | 4 0 |
| J. Smart | 4 1 |

BRECKNOCK.—For works of water supply, Llangorse, including the providing, laying, and jointing of 3-in. cast-iron mains, and other pipes and fittings, the construction of tanks, culvert, excavations, and other work. Mr. B. L. Pritchard, Surveyor, 8, Castle-street, Brecon :—

| | | | |
|---|---|---|---|
| M. Davies | £1,210 10 0 | Fryer Bros. | £710 0 0 |
| Nott & Co. | 1,002 15 8 | E. Ariel Chase | 687 1 3 |
| D. Willis | 935 18 3 | C. T. Evans, Hay* | 676 18 6 |
| J. Sutherland | 784 11 0 | | |

CARMARTHEN.—For additions to Alltyferin, Carmarthenshire. Mr. Glendinning Moxham, architect, Swansea :—

| | | | |
|---|---|---|---|
| Bennett Bros. | £1,020 | Walters & Johns, Swansea* | £950 |
| Henry Billings | 995 | | |

CATERHAM VALLEY.—For alterations to and fitting up shop, for the International Tea Co., Ltd., High-street. Messrs. William Eve & Sons, architects, 10, Union-court, Old Broad-street :—

| | | | |
|---|---|---|---|
| Rendel | £670 10 | Vigor | £527 16 |
| Newberry | 650 0 | Lascelles | 495 0 |
| Thompson | 620 0 | Watts, Johnson, & Co., Burdett Wharf, Thomas-street, Limehouse, E.* | 477 0 |
| Cadman | 619 0 | | |
| Vaughan | 570 0 | | |
| Haslemere Builders, Ltd. | 550 0 | | |

CROYDON.—For a pair of villas in Bensham-lane, Croydon, for Mr. James Powley, under the supervision of Mr. A. L. Dartnell, architect and surveyor, 69, High-street, Croydon :—

| | | | |
|---|---|---|---|
| W. Martin | £710 | Cronk & Richardson | £673 |
| F. Ludlow | 697 | E. Varley | 590 |
| W. Roberts | 697 | Sedgwick Bros. | 560 |
| G. J. Bird | 685 | | |

FRINTON-ON-SEA.—For additions and alterations to Beach House, Frinton, for Mr. R. P. Cooper, J.P. Messrs. Horner & Son, architects, Frinton, and 35, Bucklersbury, E.C.:

| | | | |
|---|---|---|---|
| H. Potter | £3,750 0 | E. Mills | £2,769 0 |
| G. D. Collins | 3,179 0 | R. Moore* | 2,402 16 |
| P. H. Oxley | 3,125 0 | | |

HENDON.—For the execution of drainage works, &c., Mill Hill, for Mr. T. E. B. Cox. Messrs. Pollard & Tingle, C.E., 31, Old Queen-street, Westminster :—

| | | | |
|---|---|---|---|
| J. Walker | £4,928 13 2 | Lee & Son | £2,775 0 0 |
| J. A. Ewart | 4,662 10 0 | T. Adams | 2,639 19 10 |
| W. H. Wheeler | 3,693 0 0 | C. Killingback | 2,625 0 0 |
| F. Dupont | 3,520 0 0 | R. Ballard | 2,611 1 8 |
| Wallis & Sons | 3,395 17 2 | G. Bell | 2,491 0 0 |
| G. R. Mann | 3,254 8 2 | J. A. Dunmore | 2,487 0 0 |
| Neave & Son | 2,927 0 0 | H. Williams, Harpenden* | 2,481 13 0 |
| Clift Ford | 2,804 0 0 | | |

HULL.—For the construction of a street near Anlaby road. Messrs. Wellsted & Easton, C.E., Prince's Dock chambers, Hull :—

| | |
|---|---|
| T. C. Starkey | £1,966 13 0 |
| B. Robinson | 1,910 0 0 |
| Boyce, Bradley, & Co. | 1,585 6 0 |
| R. Fisher | 1,569 0 11 |
| A. H. Atkinson | 1,561 0 0 |
| J. Sangwin, Northumberland-avenue, Hull* | 1,520 0 0 |

LAINDON HILLS.—For the erection of the Nightingale Stores, with stabling, High-road, Laindon Hills, Essex, for Mr. H. Foulger. Mr. P. G. Ashton, architect, Bank Buildings, 304, Romford-road, Forest Gate, E., and Ilford :—

Crabb & Maidman* ..... £450

LAINDON HILLS.—For the erection of a bungalow on the Nightingale Estate, High-road, Laindon Hills, Essex, for Mr. J. B. Greasley. Mr. P. G. Ashton, architect, Bank-buildings, 304, Romford-road, Forest Gate, E., and Ilford :—

H. and H. Bridger* ..... £250

LICHFIELD (Staffs.).—For the supply of 1,400 tons granite, also 500 tons slag, for the Rural District Council. Mr. R. J. Knapman, surveyor, Lichfield :—

| | s. d. |
|---|---|
| Freakley & Co., Tipton* | 4 3 |
| | 3 9 |
| J. Davies | 6 0 |
| | 5 5 |
| S. Mills | 6 0 |
| | 4 1 |
| Ireland & Knight | 3 9 |
| | 5 0 |
| | Kerbs, 10 in. by 4 in., per yard. |
| Williamson & Son, Macclesfield* | 1 8 |
| | Channels, 4 in. by 4 in., per ton. |
| Williamson & Son, Macclesfield* | 21 6 |
| | Kerbs, per yard. |
| P. Bailey | 1 7½ |
| P. Bailey | 4 3 |
| Watson & Co. | 2 0 |
| | Channels, per ton. |
| Watson & Co. | 22 9 |

LLANDRINDOD.—For drainage work at Disserth Rectory, Llandrindod. Mr. Glendenning Moxham, architect, Swansea :—

Price & Williams, Builth* ..... £192 10

LONDON.—For the erection of school buildings, Hercules-road, Lambeth, for the Trustees of the Lambeth Boys' School. Mr. J. Arthur Reeve, architect. Quantities by Messrs. Selby & Sanders :—

| | | | |
|---|---|---|---|
| Pritchard & Renwick | £10,120 0 0 | Holloway Bros. | £9,200 0 0 |
| G. Jackson | 9,928 0 0 | Stimpson & Co. | 8,990 0 0 |
| B. E. Nightingale | 9,639 0 0 | Hooper & Son | 8,950 0 0 |
| T. L. Green | 9,537 0 0 | W. J. Renshaw | 8,944 0 0 |
| Foster & Dicksee | 9,376 0 0 | Scutt & Sons | 8,850 17 9 |
| Smith & Sons | 9,375 0 0 | J. G. Sharpington | 8,748 0 0 |
| Shillitoe & Son | 9,300 0 0 | Lorden & Sons | 8,666 0 0 |
| C. A. Ansell | 9,229 0 0 | J. Parsons | 8,640 0 0 |
| | | J. Appleby, Stamford-st., S.E.* | 8,325 0 0 |

LONDON.—For the erection of the superstructure of cold stores, Block D, and additional works to basement of B and C, at Greenbank and Morgan's lane, Tooley-street, S.E., for the London Riverside Cold Storage Co., Ltd. Messrs. Newman & Newman, architects, 31, Tooley-street, London Bridge. Quantities by Mr. R. C. Gleed, 8 and 9, Martin's-lane, Cannon-street, E.C. :—

| | | | |
|---|---|---|---|
| G. Parker | £26,879 | Rider & Sons | £25,563 |
| Colls & Sons | 26,812 | W. Downs | 25,444 |
| Hall, Beddal, & Co. | 26,180 | Perry & Co. | 25,157 |
| Patman & Fotheringham | 25,793 | J. Greenwood, Arthur-street, E.C.* | 24,467 |

DUKINFIELD.—For sewering several streets, Crescent-road, and others, for the Corporation. Mr. Samuel Hague, Borough Surveyor, Town Hall, Dukinfield :—

| — | Crescent-road, &c. | King-street and Wharf-street. | Ashton-street. | Bridge-Eye. | Total. |
|---|---|---|---|---|---|
| | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. |
| Pryke & Haward | — | 288 11 8 | 535 19 6 | 296 19 1 | 2,001 8 8 |
| W. Underwood & Bro., Dukinfield | 1,061 3 0 | 125 9 0* | 423 1 0* | 252 2 6* | 2,192 9 9 |
| W. H. Worthington, Manchester | 944 13 0* | 380 18 0 | 567 14 3 | 299 4 6 | 2,124 13 9 |
| Etheridge & Clarke, Manchester | 1,083 11 0 | 216 3 0 | 543 13 0 | 281 9 6 | 2,416 18 3 |
| Geo. Wilde, Dukinfield | 1,296 16 0 | 290 3 3 | 557 12 0 | 272 7 0 | 2,519 1 6 |
| N. Beddows & Co., Pendlebury | 1,868 9 0 | 1,082 9 0 | 1,084 13 6 | 483 10 0 | 4,190 0 0 |
| Surveyor's estimate | 1,138 0 0 | 290 0 0 | 602 0 0 | 230 0 0 | 2,160 0 0 |

[*See also next page.*

LONDON.—For the erection of new warehouses, Durward-street, Whitechapel, for Messrs. Kearley & Tonge, Ltd. Messrs. William Eve & Sons, architects, 10, Union-court, Old Broad-street, E.C.:—

*Substructure.*

| | | | |
|---|---|---|---|
| Foster & Dickson | £2,015 | F. & H. F. Higgs | £1,624 |
| Holloway Bros. | 1,785 | Patman & Fotheringham | 1,603 |
| Perry Bros. | 1,687 | Harris & Wardrop, Limehouse, E.* | 1,549 |
| Killby & Gayford | 1,663 | | |
| Nightingale | 1,639 | | |

LOWESTOFT.—For Baptist schools, Grove Park, Lowestoft. Messrs. George Baines & R. Palmer Baines, architects, 5, Clement's Inn, Strand, London, W.C.:—

| | | | |
|---|---|---|---|
| W. Knights | £2,040 12 9 | Bedwell & Parker | £1,690 0 0 |
| J. Welham | 1,812 10 0 | C. R. Cole | 1,670 0 0 |
| R. C. Todd | 1,799 0 0 | C. E. Earll | 1,466 17 0 |
| G. Elsey | 1,710 0 0 | | |

OXFORD.—Accepted for addition to, and reconstruction of, laundry at Radcliffe Infirmary. Mr. J. Augustus Souttar, architect, 41, Bishopsgate-street Within, E.C.:—

Kingerlee & Sons, builders, Oxford ....
D. and J. Tullis, Ltd., London, laundry engineers ..... } £1,225

PARKESTONE (Essex).—For the erection of new schools for 550 children and alterations to the present schools, boundary walls, playgrounds, &c., for the Ramsey School Board. Messrs. Start & Rowell, architects, Colchester. Quantities prepared by the architects:—

| | | | |
|---|---|---|---|
| The Oak Building Society | £5,875 | E. West | £4,949 |
| A. E. Symes | 5,679 | Grimwood & Son | 4,885 |
| C. & J. Ambrose | 5,059 | E. Saunders | 4,799 |
| A. W. Robins | 5,786 | Theobald | 4,582 |
| McKay | 5,720 | Dupont & Co. | 4,196 |
| F. Bennett | 5,181 | R. Beaumont | 4,112 |
| F. Chambers | 4,997 | Smith & Beaumont, Harwich* | 4,096 |

RYTON-ON-TYNE.—For road improvement works, also construction of a culvert, Spen Burn, for the Urban District Council. Mr. J. P. Dalton, Engineer, Council Offices, Ryton-on-Tyne. Quantities by Engineer:—

| | | | |
|---|---|---|---|
| Hardy & Atkinson | £714 0 8½ | B. Firth | £370 19 0 |
| W. Cumming | 460 9 4 | M. A. Armstrong | 259 13 4 |
| G. Wells | 330 15 9 | A. Tench, Blaydon* | 232 10 1½ |

[Engineer's estimate, £250.]

SHEFFIELD.—For new Board School, Greystones, Sheffield, for the Sheffield School Board. Messrs. Hemsoll & Paterson, architects:—

Ash, Son, & Biggin, Furnival-street, Sheffield* £10,795

SHIRLEY.—For tar-paving Shirley (Southampton) Board Schools. Mr. John H. Blizard, Architect and Surveyor to the School Board:—

| | | | |
|---|---|---|---|
| North of England Asphalte Co. | £1,043 12 0 | Bradshaw & Son | £849 0 0 |
| J. Brook | 1,015 7 0 | Asphaltic Limestone Concrete Co. | 811 19 1 |
| Jenkins & Sons, Ltd. | 869 0 0 | Wainwright & Co., Shepton Mallet† | 740 13 0 |

SWANSEA.—For the erection of a house at the Olchfa, Sketty, Swansea. Mr. Glendinning Moxham, architect, 39, Castle-street, Swansea:—

| | | | |
|---|---|---|---|
| Lloyd Bros. | £2,770 | Walters & John | £2,600 |
| J. & F. Weaver | 2,650 | John Davies | 2,576 |
| David Jenkins | 2,645 | Bennett Bros.* | 2,547 |
| Henry Billings | 2,630 | | |

[All of Swansea.]

SWANSEA.—For the erection of new chancel, St. Barnabas, Waunarlwyd, Swansea. Mr. Glendinning Moxham, architect, Swansea:—

| | | | |
|---|---|---|---|
| John Davies | £532 10 | Walters & Johns | £460 0 |
| Thomas Richards | 532 1 | Bennett Bros.* | 439 0 |
| Henry Billings | 517 0 | | |

[All of Swansea.]

SWANSEA.—For rebuilding shop, 19, High-street, Swansea. Mr. Glendinning Moxham, architect, Swansea:—

Henry Billings, Swansea* ..... £880

SWANSEA.—For additions to Brynbriallu, Swansea. Mr. Glendinning Moxham, architect, Swansea:—

H. Billings, Swansea* ..... £250

SWANSEA.—For a pair of cottages, Murton, Swansea. Mr. Glendinning Moxham, architect, Swansea:—

H. Billings ..... £596 | T. Davies, Swansea* .. £520

TALYBONT (Wales).—For the erection of water supply works for the Brecknock R.D.C. Mr. B. L. Pritchard, surveyor, 8, Castle-street, Brecon:—

| | | | |
|---|---|---|---|
| David Willis | £791 0 | Fryer Bros., Brecon* | £460 0 |
| F. Martin | 474 11 | | |

WREXHAM.—For widening road, &c., Pentre Broughton, for the Rural District Council. Mr. A. Woolley, surveyor, 2, Temple-row, Wrexham:—

| | | | |
|---|---|---|---|
| T. Jones, Wrexham | £367 0 0 | | |
| R. S. Roberts, Broughton* | 210 18 9 | | |

[Surveyor's estimate, £250].

YSTALYFERA.—For new shop at Ystalyfera, for Mr. Luther Lloyd. Mr. Glendinning Moxham, architect, Swansea:—

| | | | |
|---|---|---|---|
| Marles Bros. | £710 0 | D. Rees, Ystalyfera* | £512 10 |
| Benjamin Lewis | 610 0 | | |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